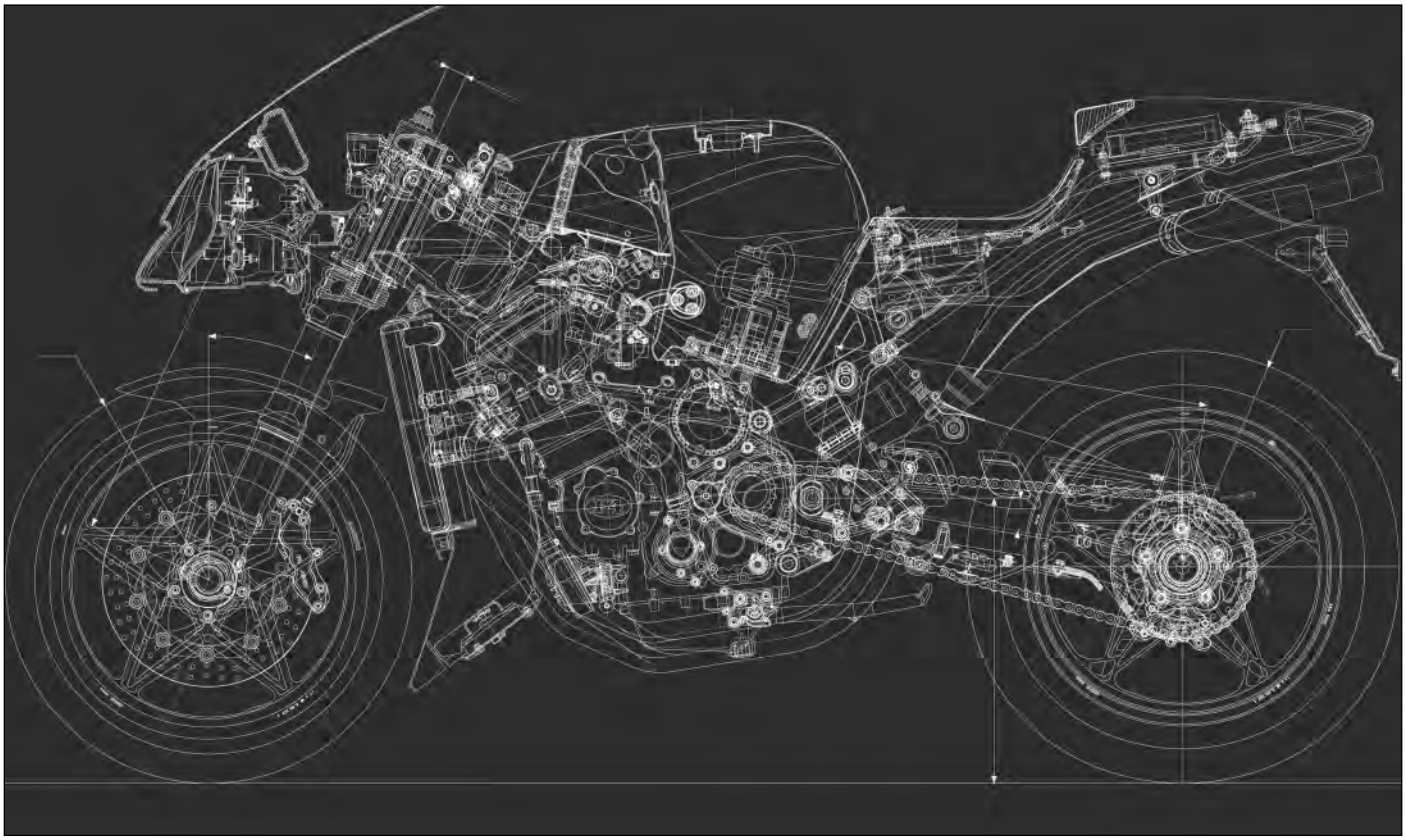


F

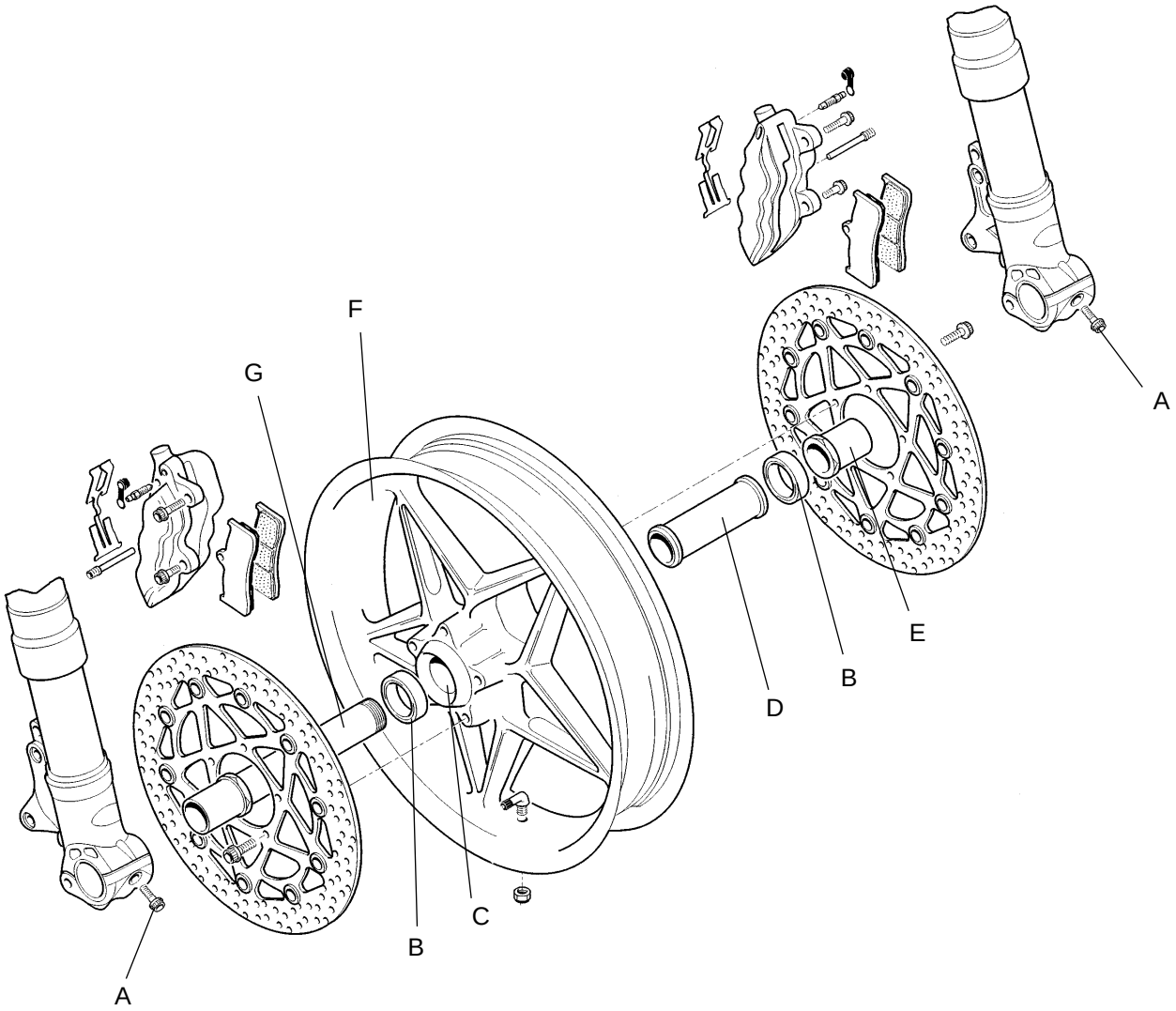
SECTION F

Revision 1

SUMMARY

FRONT WHEEL . . . . . .PAGE 3
FRONT FORKS . . . . . .PAGE 10
STEERING ASSEMBLY . . . . . .PAGE 23
REAR SUSPENSION AND FORK . . . . . .PAGE 31
REAR WHEEL HUB . . . . . .PAGE 46
MOTORCYCLE SET-UP ADJUSTMENT . . . . . .PAGE 58
WHEELS - CHECK AND BALANCING . . . . . .PAGE 62

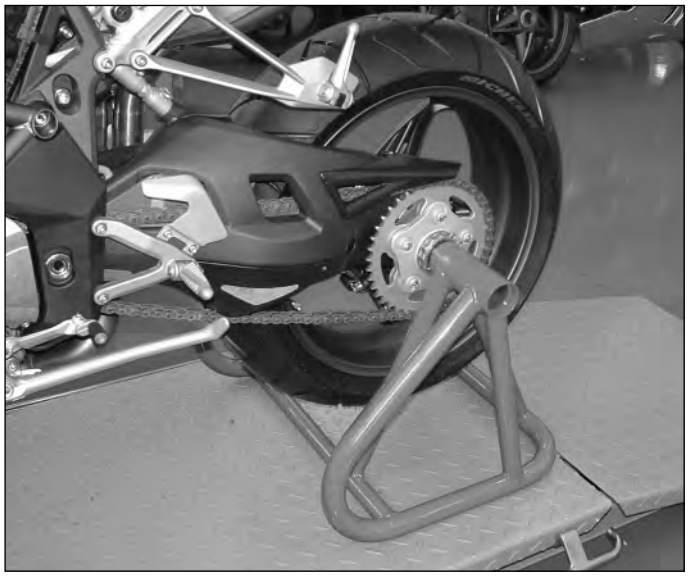
FRONT WHEEL



		A	B	C	D	E	F	G	H	I	L
Torque pressure	N·m	20 ÷ 22				40 ÷ 44					
	Kg·m										
	ft·lb										
Operation											

Description	F4 750 ORO	F4 750 S	F4 750 S (1+1)
FRONT WHEEL			
Material	Magnesium alloy	Aluminium alloy	Aluminium alloy
Dimensions	3,50” x 17”	3,50” x 17”	3,50” x 17”
FRONT TYRE			
Dimensions	120/65-ZR 17	120/65-ZR 17	120/65-ZR 17
Brand and type	PIRELLI - Dragon Evo MTR21 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica	PIRELLI - Dragon Evo MTR21 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica	PIRELLI - Dragon Evo MTR21 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica
Front tyre pressure	PIRELLI-METZELER 2.5 bar (36 psi), MICHELIN 2.2 bar (32 psi), DUNLOP 2.3 bar (33 psi)		

Before proceeding with the removal and overhaul of the components relative to the front suspension, it is advisable to remove beforehand the front mudguard, the under-engine fairing, the right and left fairing side panels, the nose fairing, the air compartment conduits and the relative side pieces as described in detail in chapter C “Bodywork”.



Place the motorcycle on the rear stand.

Special tool: N. 800092642

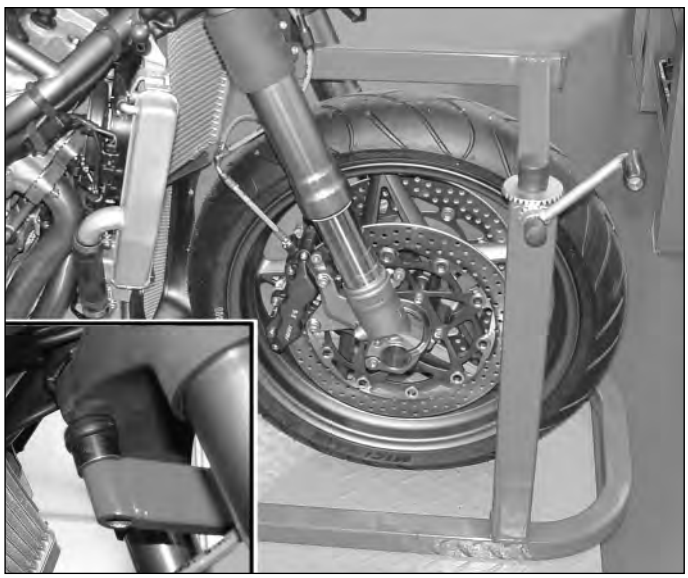
FRONT WHEEL REMOVAL

Front brake caliper removal

Unscrew the two fixing screws of both front calipers and remove the calipers.

Protect the disassembled calipers with protective material thereby avoiding possible damage to the wheel rim.

Lift the motorcycle up at the front end.
Mount the special tool that is supplied with a pin on the lower part of the steering base as shown in the figure.
Lift the motorcycle up.



Special tool No. 800095807 and No. 800095808

N.B. **To facilitate the removal of the wheel it is advisable to tape the brake tubing to the special tool.**

Remove the screw on both front wheel/fork attachments.

During this operation, it is necessary to support the wheel.

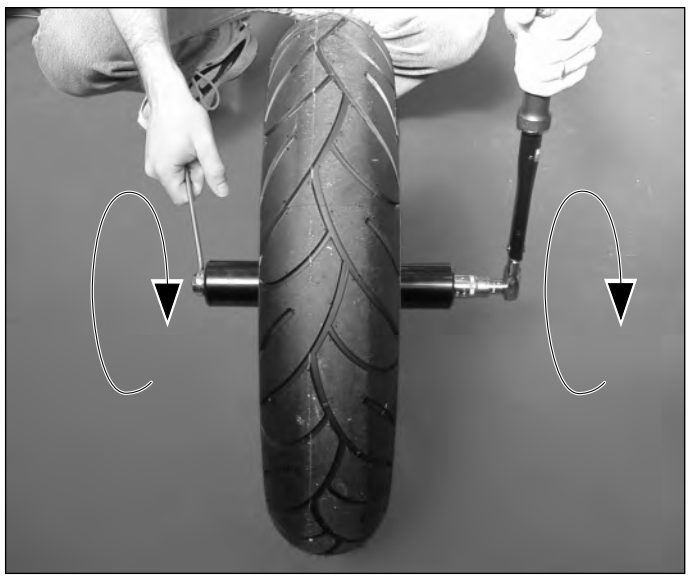
Front wheel bearing check

With the wheel spindle still mounted to the wheel, rotate the wheel to check that the bearings are not pitted and rotate with a smooth action. Check also for axial (A) and/or radial (B) movement. If either condition is verified, substitute the bearings.

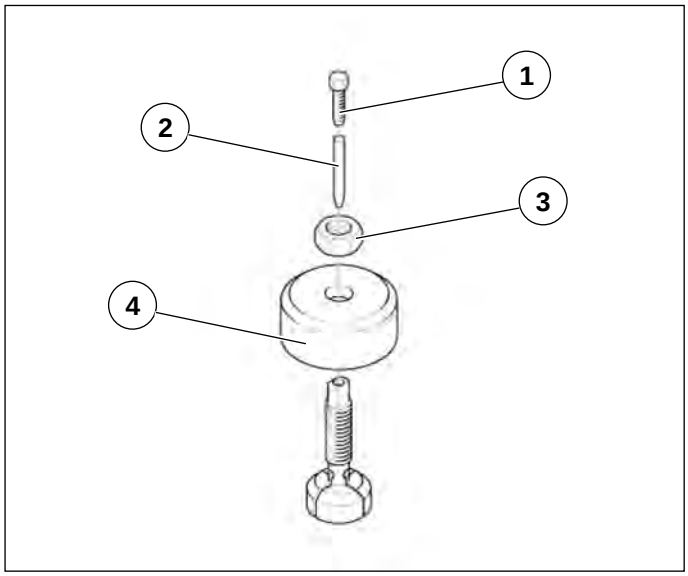
Front wheel bearing substitution

Remove the wheel spindle utilising the special tool as shown in the figure.

Special tool No. 800092872



Utilise the special tool to extract the bearings. To assemble the tool, it is necessary to remove the screw (19 and extract the wheel spindle (2). Remove the nut (3) and then the flange (4).



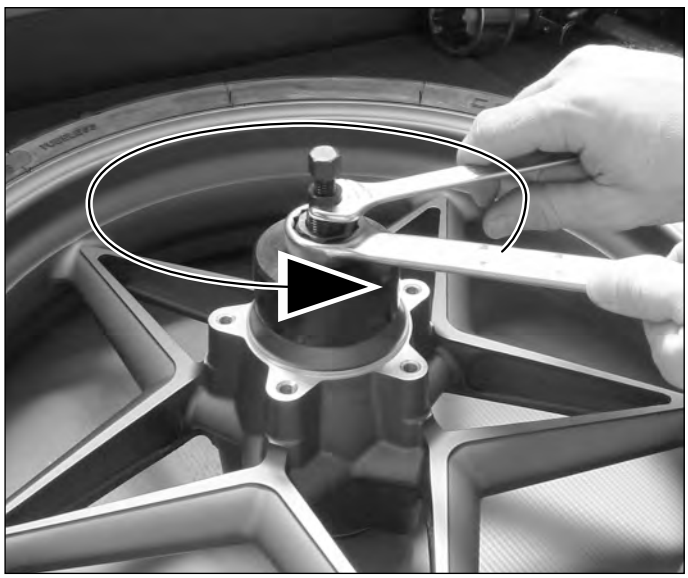
Before substituting the bearings as indicated above it is advisable to remove the brake discs as indicated in chapter H "Brakes" to avoid damaging them.

Special tool No. 800092862

F

Introduce the extractor until the internal ring of the bearing is hooked up. Introduce the wheel spindle and screw and **manually block them**.

Mount the flange, spacer ring and nut utilising a 14 mm spanner and a 27 mm spanner and extract the bearing as shown in the figure.



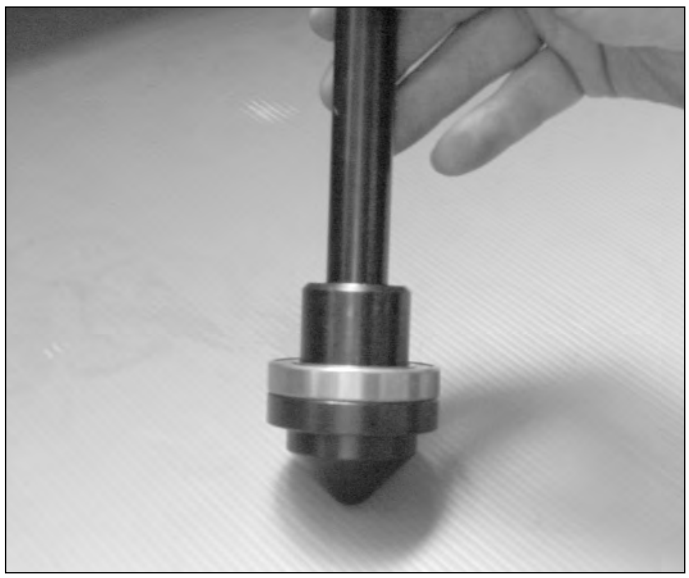
N.B. **Operate in the same way on both bearings.**

Check that the ends of the aluminium spacer and the seats of the bearings on the wheels are not scored or marked.

Reassembly – front wheel bearings

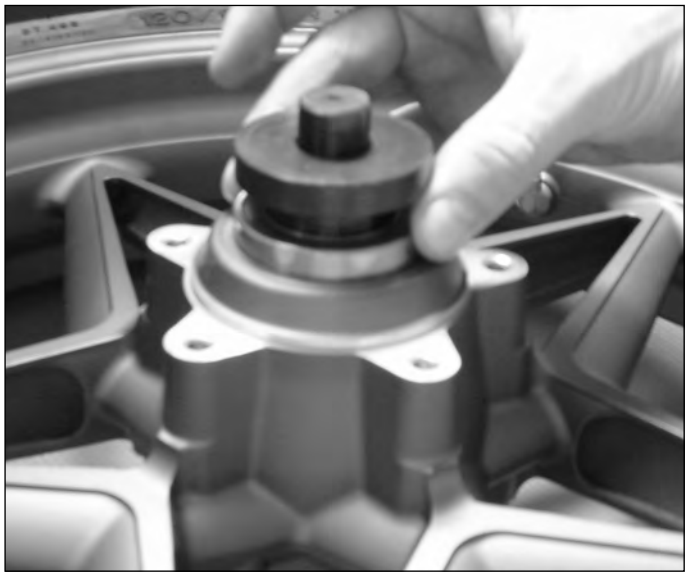
Before proceeding with the reassembly, accurately clean the bearing seats in the wheel hub.
Mount a bearing onto the special tool

Special tool No. 800092868



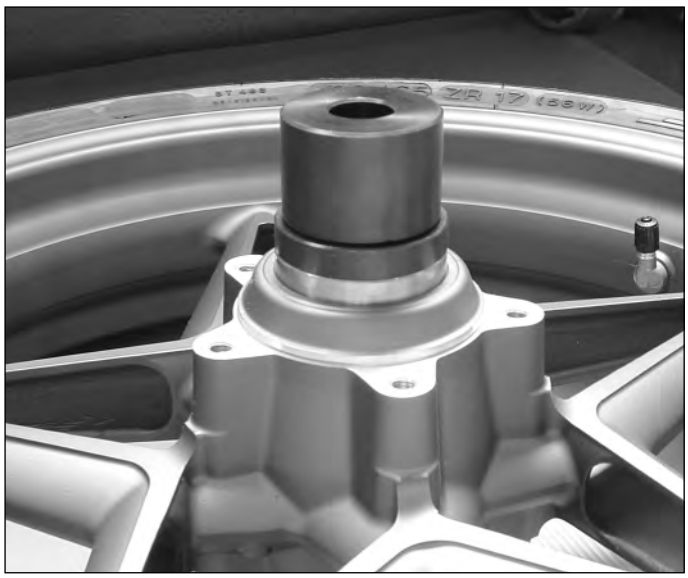
Introduce the stem of the tool into the wheel hub. Turn the wheel upside down and insert the aluminium spacer.

Assemble the other bearing and the guide.

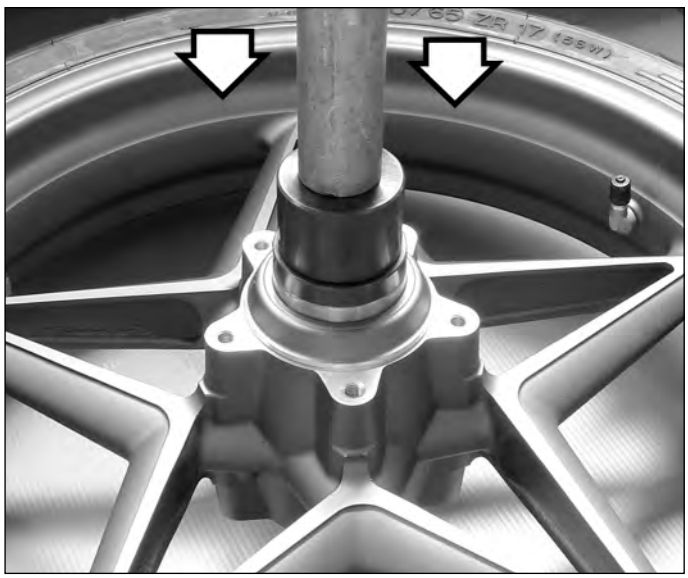


F

Insert the guide spacer and utilising a press, squeeze down the bearings.



Proceed as illustrated in the figure.



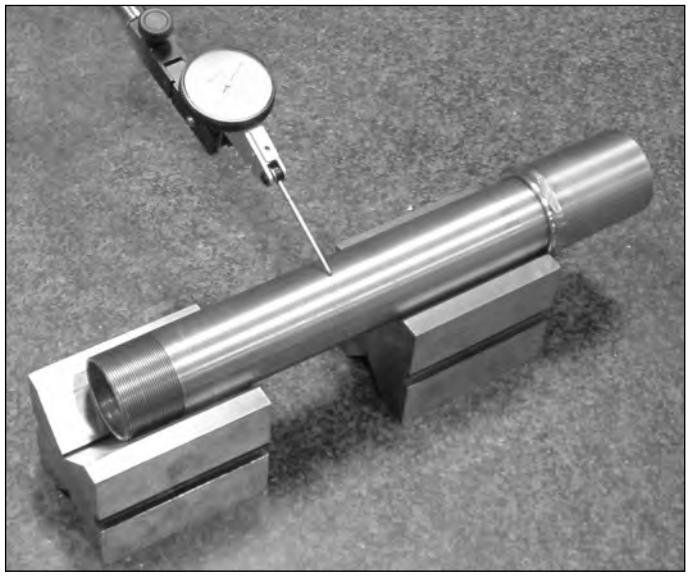
Attention: the wheel bearings should be mounted with little interference but should the action of the press be blocked in any way, release the press.

Having completed the assembly, check that the aluminium spacer does not have axial play.
Assemble the wheel spindle and carry out again the rolling check by rotating the wheel.

Wheel spindle check

Place the wheel spindle on two v-prisms on a flat surface.

Utilising a dial gauge, check that the eccentricity in the central part does not exceed 0.05 mm.



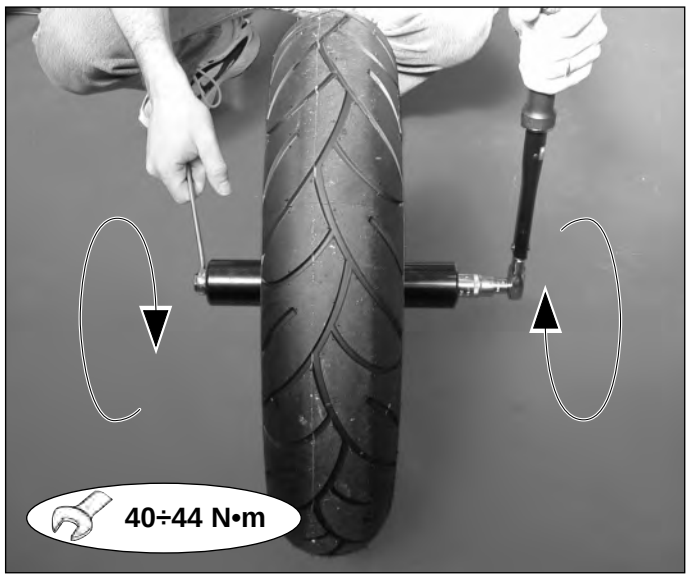
Wheel assembly

⚠ **If the front tyre is substituted, before assembling the wheel it is necessary to balance the wheel following the indications in page 62.**

After having carried out the check on the parts of the front wheel, accurately clean the wheel spindle and assemble it from right to left. Tighten the screw ring of the wheel spindle to the torque prescribed utilising the special tool. Ensure that when the wheel is mounted into place, the screw ring of the wheel spindle must be on the left side of the motorcycle.

Torque pressure: 40 ÷ 44 N·m

Special tool No. 800092872



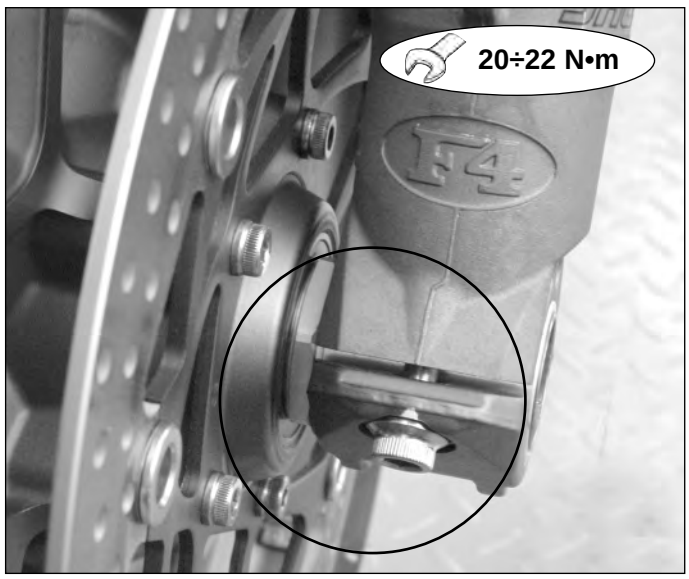
Mount the wheel, complete with wheel spindle onto the wheel attachments of the front forks.

Ensure that the attachments do not sit on the external face of the hexagon.

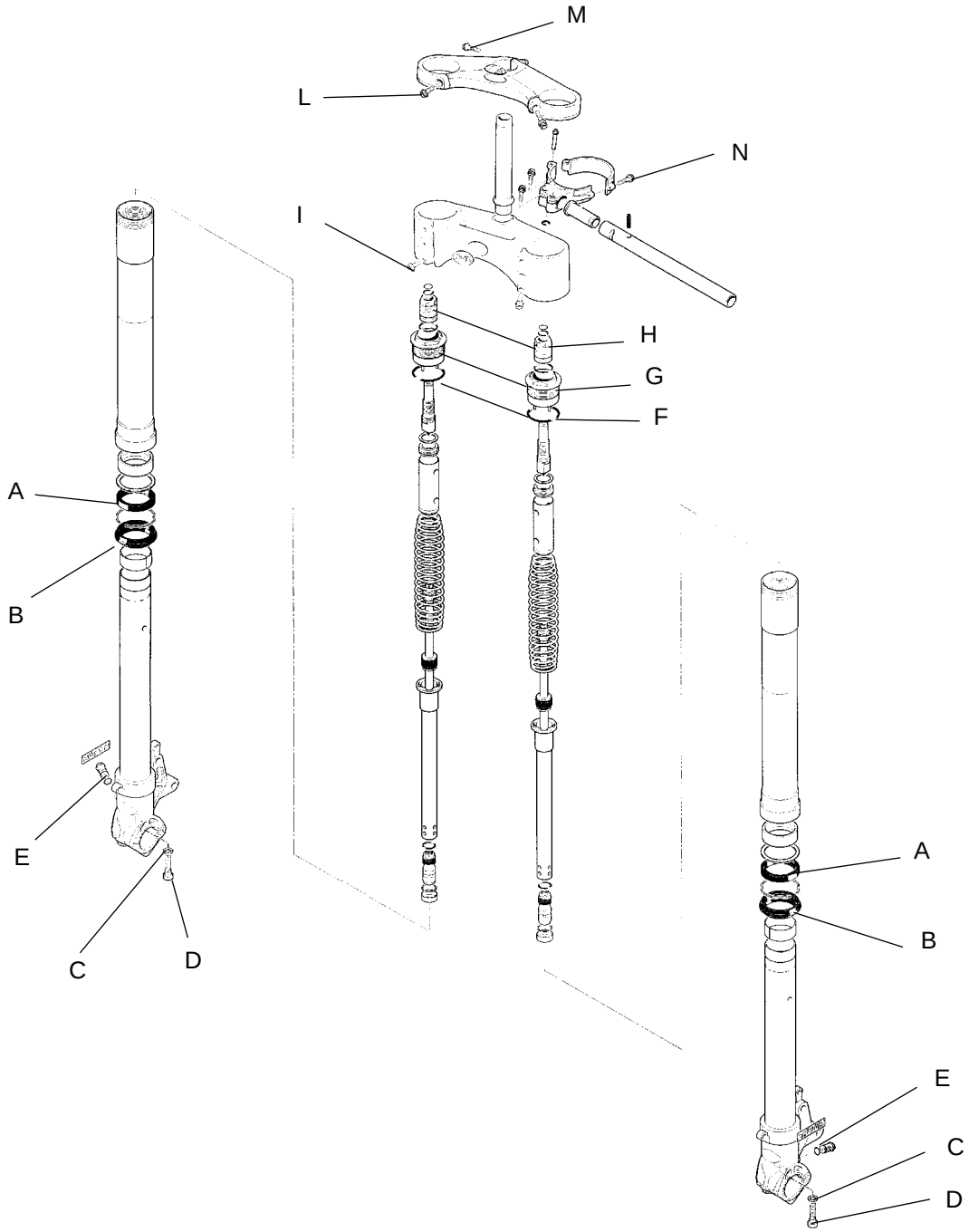
Tighten the two screws to the torque pressure prescribed.
Mount the two brake calipers as described in chapter H “Brakes”.

Torque pressure: 20 ÷ 22 N·m

During this phase it is necessary to support the front wheel to avoid snagging the two screws.



FRONT FORK



		A	B	C	D	E	F	G	H	I	L	M	N
Torque pressure	N·m				30 ÷ 40			30 ÷ 40		8 ÷ 9	16 ÷ 18	22 ÷ 24	8 ÷ 9
	Kg·m												
	ft·lb												
Operation													

Description	F4 750 ORO	F4 750 S	F4 750 S (1+1)
FRONT SUSPENSION			
Type	Hydraulic telescopic forks with the stems positioned upside down, equipped with a system of external adjustment for extension, compression and spring preload		
Ø stems (mm)	49	49	49
Telescopic movement (mm)	118	118	118

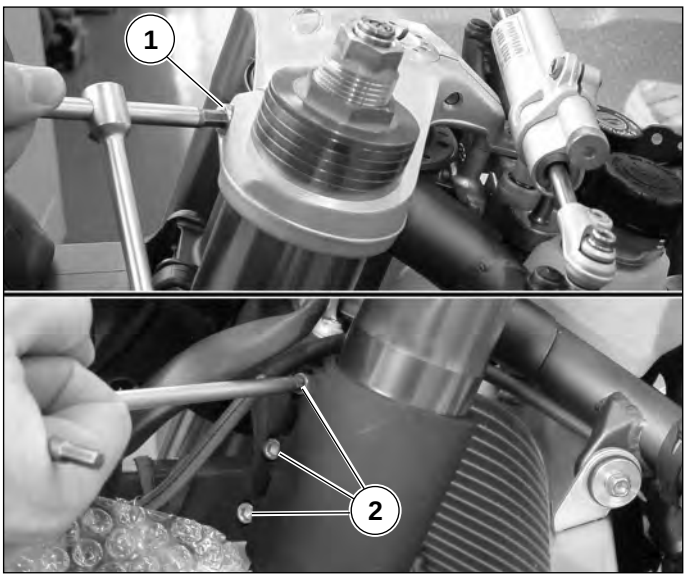
FRONT FORK OVERHAUL

Remove the front wheel as described previously in this chapter.
Remove the left clip-on handlebar by unscrewing the screws shown in the figure. Protect the clip-on handlebar with protective material.
Utilise the same procedure for the right clip-on handlebar.

The protection of the clip-on handlebars is necessary to stop scratching painted parts of the motorcycle.

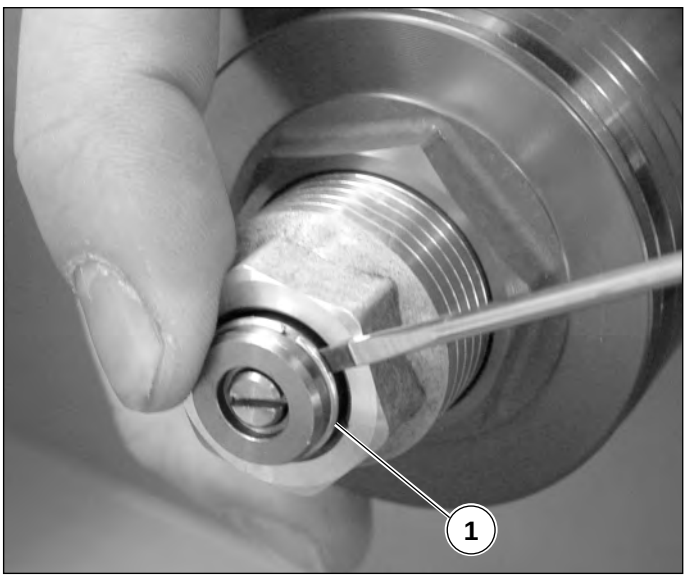
Stem removal

Slacken the screw (1) of the steering head and the three screws (2) of the steering base.
During this phase, support the stem.
Slide out the stem, supporting it with both hands and operating with caution so as not to drop it.
Proceed with the same operation for both stems.

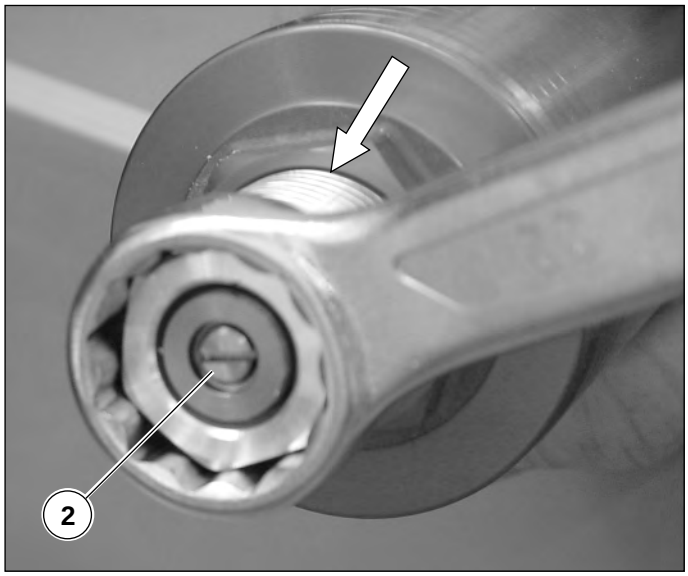


Fork tube overhaul

Remove the spring clip (1) of the spring preload adjuster.



Slacken the preload spring adjuster (2) until the nut comes level with the central part of the cap, as indicated in the figure.
In this position there are seven marks showing on the preload spring adjuster (see figure).



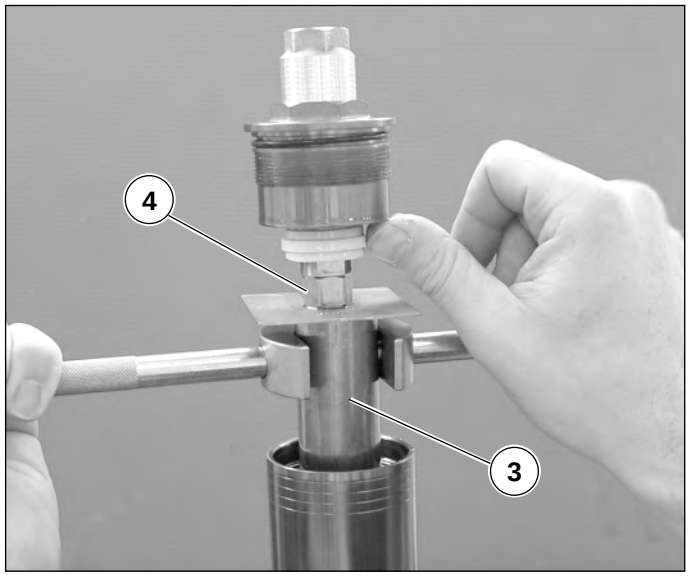
F

Slacken the fork cap.

Completely unscrew the cap and lower the stem into the position shown in the figure.
This operation must be carried out keeping the stem in a vertical position.

Mount the special tool on the upper holes of the spring-push spacer as shown in the figure.
Lower the spacer (3) and insert the thin plate between spacer and the locknut (4).

Special tool No. 800094919

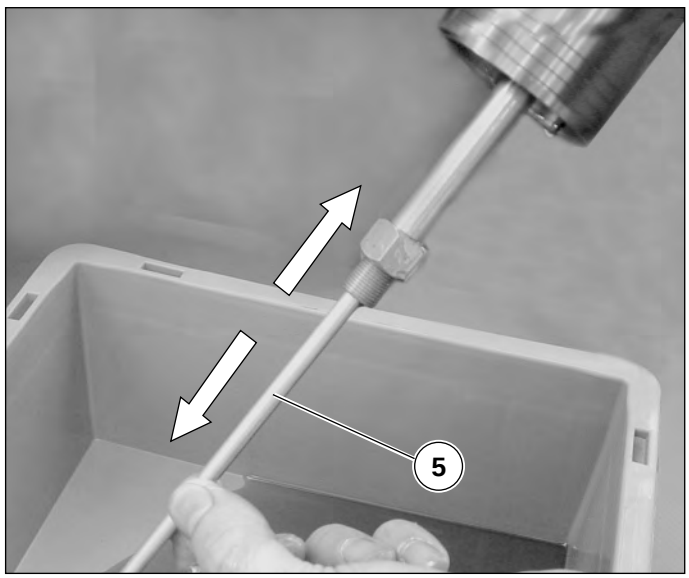


Utilising two spanners slacken the locknut and unscrew the cap of the pump rod.
Press again on the special tool and remove the thin plate.
Remove the spring-push spacer and the spring.
Turn the stem upside down and completely pour out the oil into a suitable container.

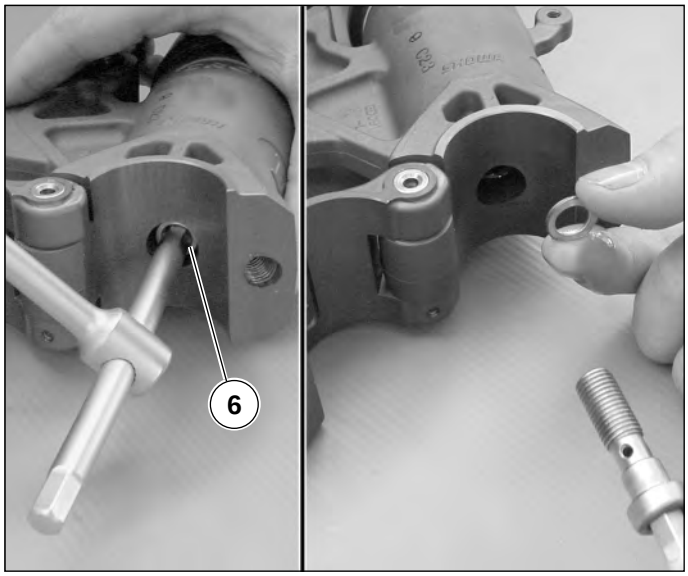
Special tool No. 800094919

Recover the oil in an appropriate container. Do not dispose of the used oil in the environment.

Pump the rod a few times to facilitate the removal of all the oil.
Remove the internal rod (5), the lower pin and the spring.

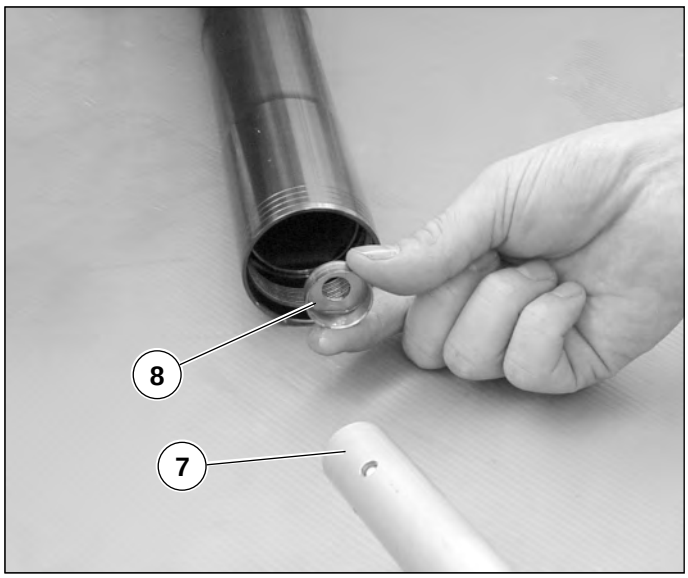


Unscrew the lower central screw (6) that fixes the pump unit.
Be careful to collect the seal washer underneath.

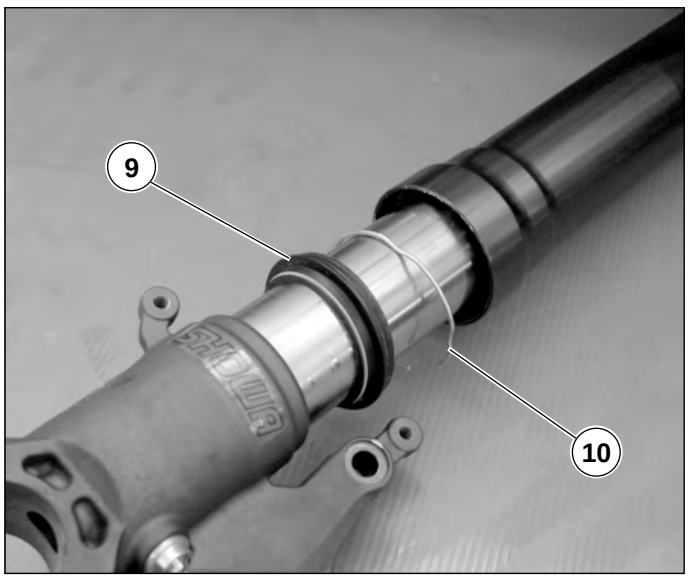


F

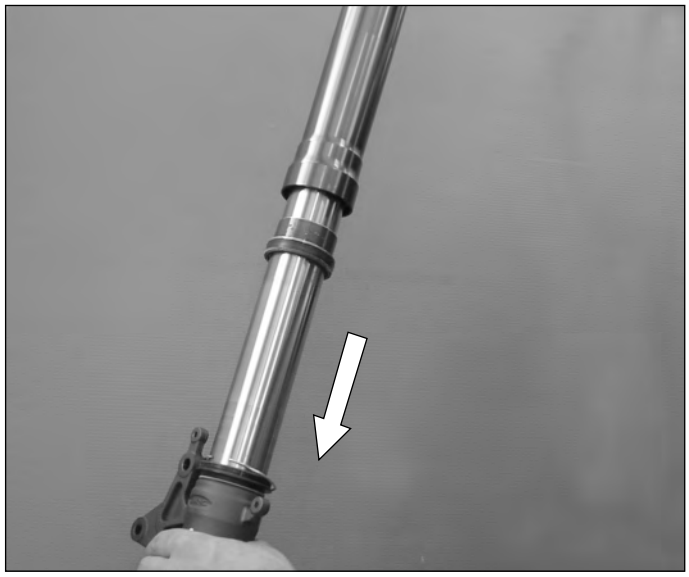
Extract the pump unit (7) and the lower cap (8).



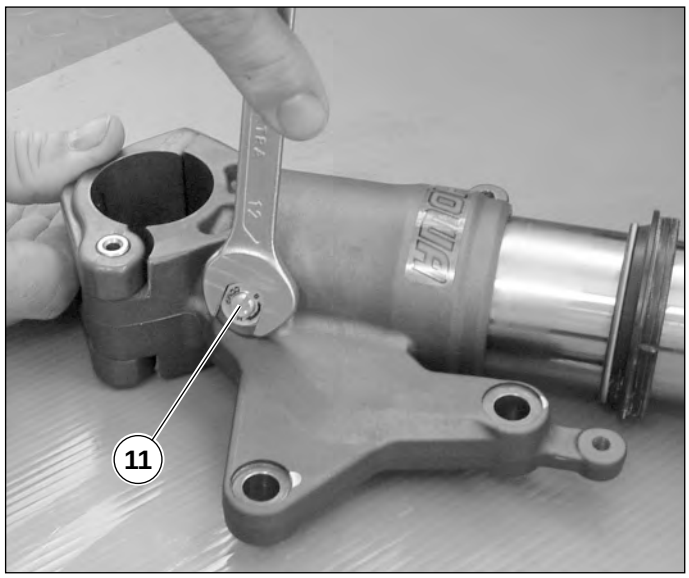
Lower the anti-dust seal (9).
Remove the retaining ring (10) with a screwdriver, taking care to not scratch the stem.



Extract the sleeve from the stem by repeated blows at the end.

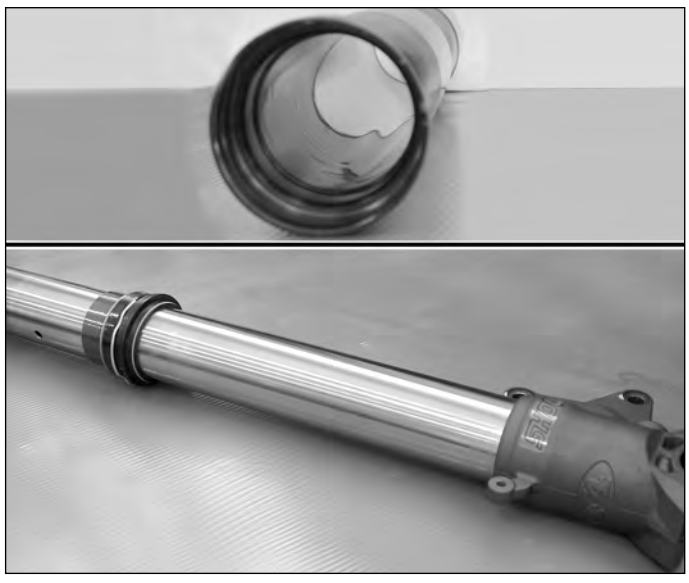


Disassemble the hydraulic braking adjuster (11) under compression.

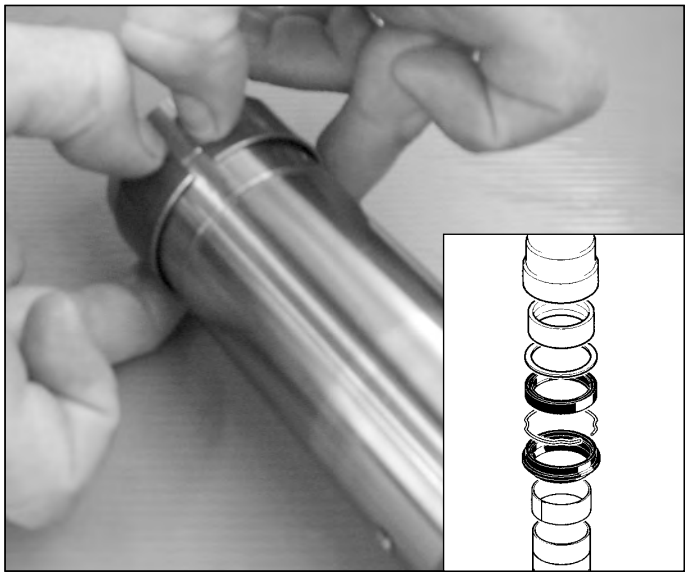


Fork assembly check

Check that the sleeve does not have marks on the external part that could have repercussions inside the assembly. Ensure that the inside is completely smooth, without any scratches.
If necessary, substitute with a new part.



Check for marks or scratches on all surfaces of the stem and check the condition of the chroming.



Check the length of the spring (240 mm minimum).

Manually widen the upper bush and extract it.
Remove the lower bush, the washer, the oil seal, the stop ring and the anti-dust seal (see figure).

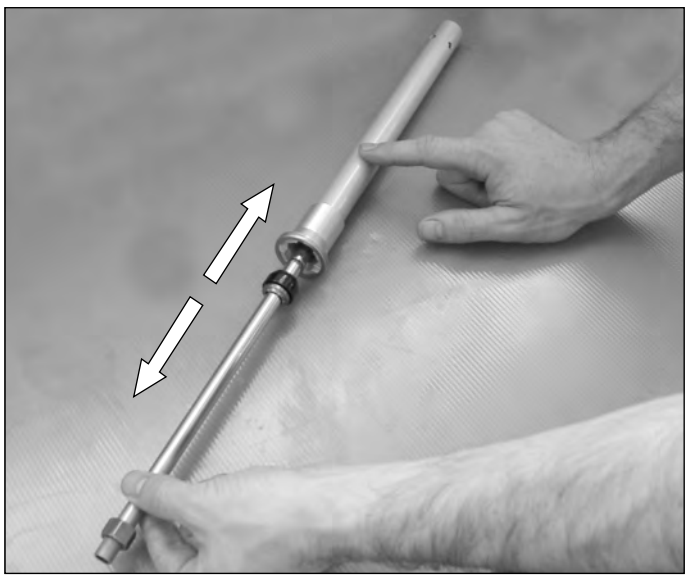
F

Assembly oil seal and anti-dust seal

After having carefully checked all components, substitute those damaged and/or deteriorated.
Grease the lips of the new anti-dust seal and the new oil seal with the appropriate grease.
Apply a "sleeve" of nylon to the upper part of the stem (see figure), to protect the oil seal and the anti-dust seal from any sharp edges on the lips of the stem during assembly.

Recommended grease: MOLYKOTE 55 M

Visually check for scratches and marks on the pump rod and check that it slides smoothly inside the pump unit without chamfering.
Substitute if necessary.

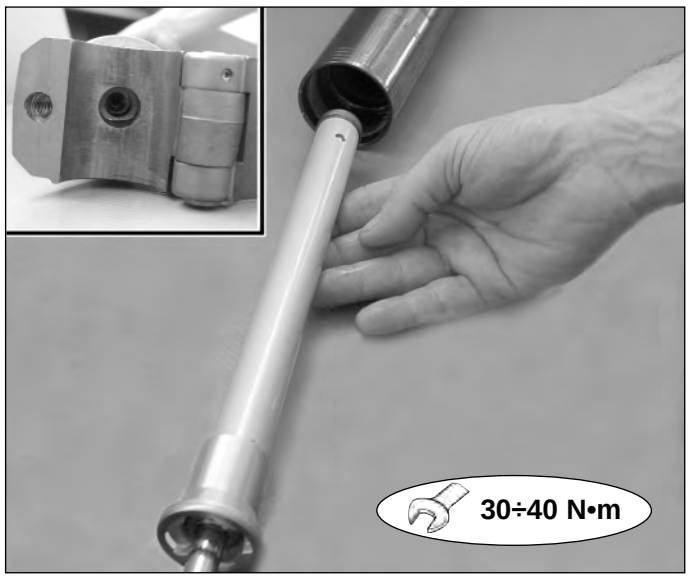


Assemble the stem into the sleeve, placing the ferrules into their seats with the respective washers. Utilise the special tool
Using the same technique, assemble the oil seal and its stop ring and then manually assemble the anti-dust seal.

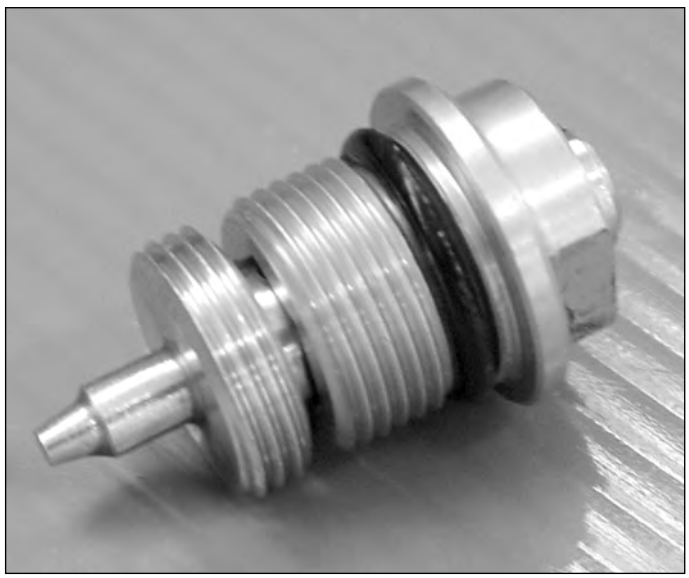
Special tool No. 800094918

Assemble the pump unit complete with cap inside the stem.
The pump unit must be aligned with the hole of the stem and carefully pushed into its seat.
Insert the lower screw, mounting a new seal washer and tighten the screw to the prescribed torque pressure.

Torque pressure: 30 ÷ 40 N·m

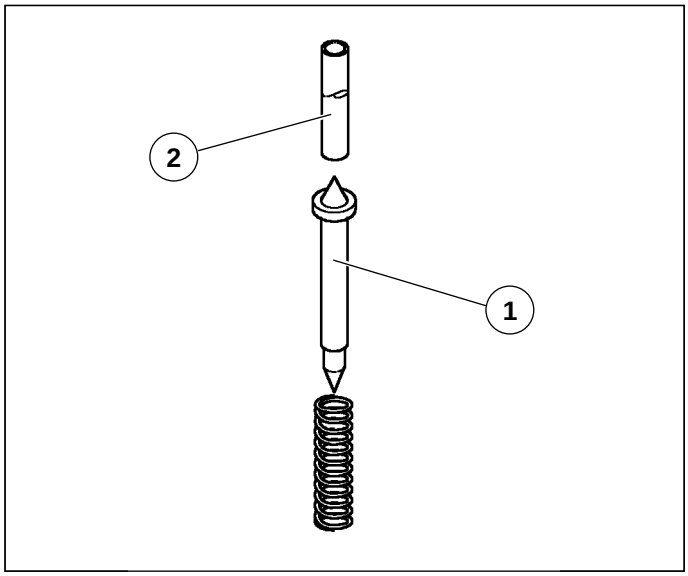


Reassemble the hydraulic brake adjuster under compression into its seat by utilising a new O-ring seal.



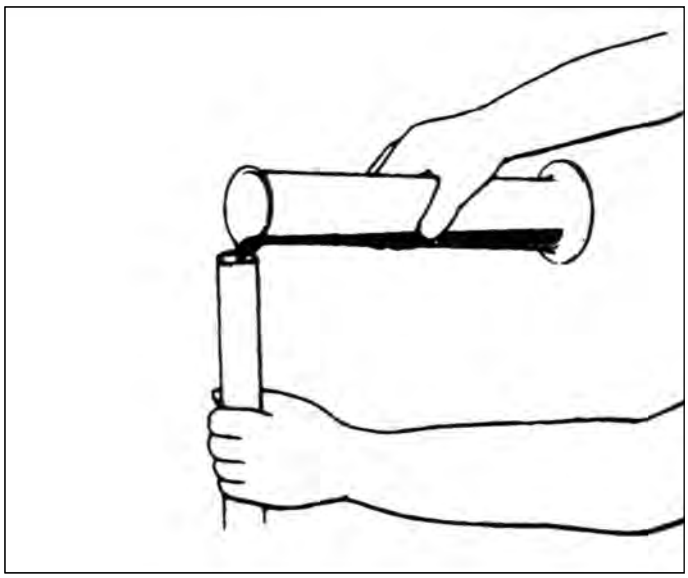
F

Insert the lower pin (1) complete with spring, into the pump rod and then slide in the internal rod (2).



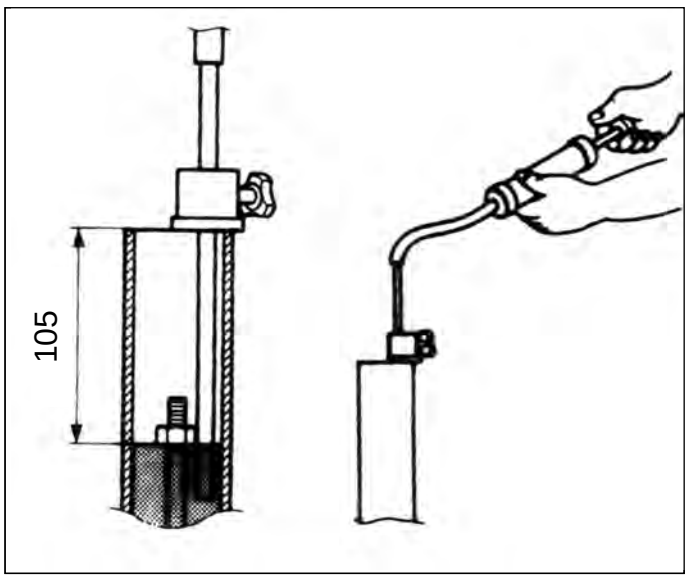
F

Maintain the sleeve in a vertical position. Introduce **648 cc of suspension oil (SHOWA SS08).**
Press the pump rod up and down (see figure) until a perfect fluidity of movement is obtained.



Recommended suspension oil: SHOWA SS08

Check that the oil level is at **105 mm** from the upper edge of the sleeve including the upper edge as well.

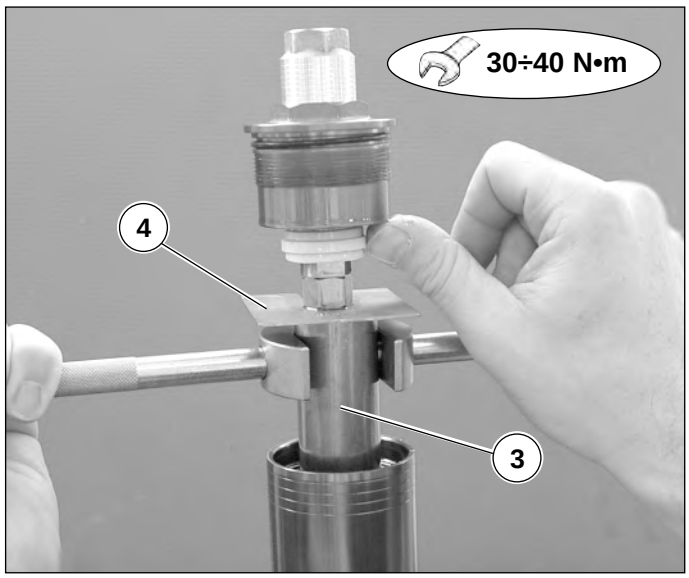


Manually screw in the locknut until it reaches the end of the thread. Introduce the spring.

Mount the aluminium spacer (3), utilising the appropriate special tool and then press down the spring and insert the thin plate (4).
Reassemble the complete cap with a new O-ring.
Tighten the complete cap of the locknut to the prescribed torque pressure.

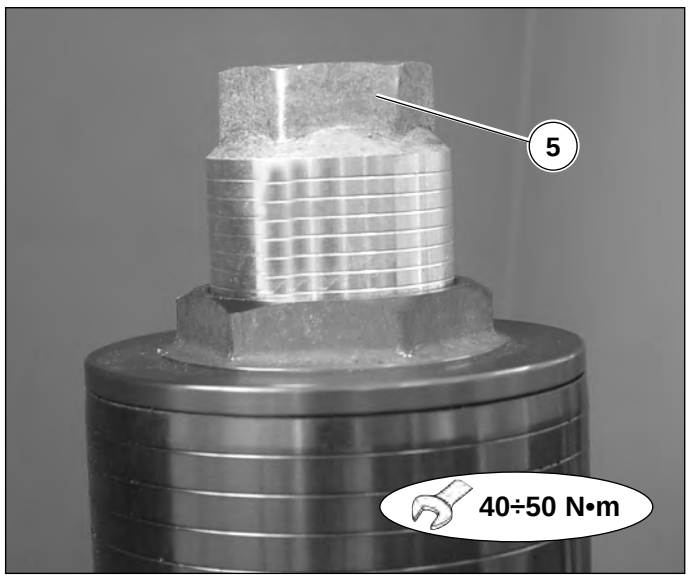
Special tool No. 800094919

Torque pressure: 30 ÷ 40 N·m



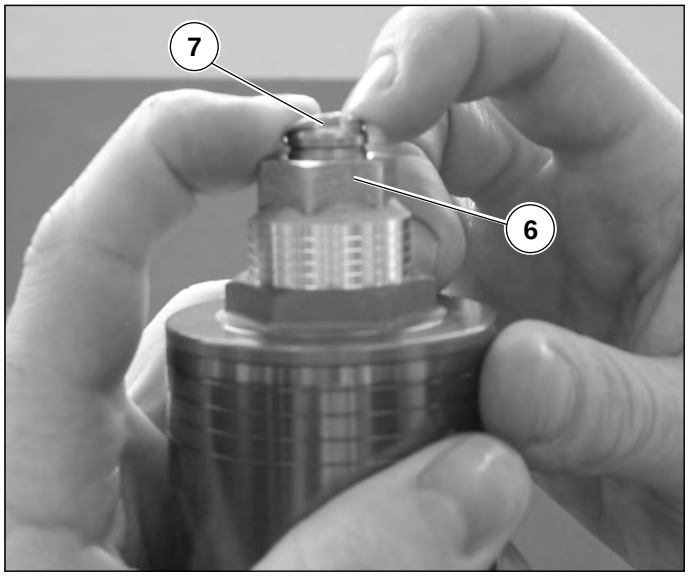
Reassemble the cap (5) on the stem, tightening it to the prescribed torque pressure.

Torque pressure: 40 ÷ 50 N·m



F

Adjust the spring preload to the fifth mark by regulating the adjuster (6).
Insert the retaining ring (7).



F

Left stem assembly

Reassemble the stem taking care to pass the electrical wiring and the clutch tube inside the stem (between the stem and the steering head).
Lift up the stem until the third mark is in line with upper surface of the steering arm on the inside (see figure).
Screw in and tighten the three screws at the base of the steering.

⚠ **Carry out this assembly correctly. A casual or inexact assembly could compromise the stability and steering of the motorcycle.**

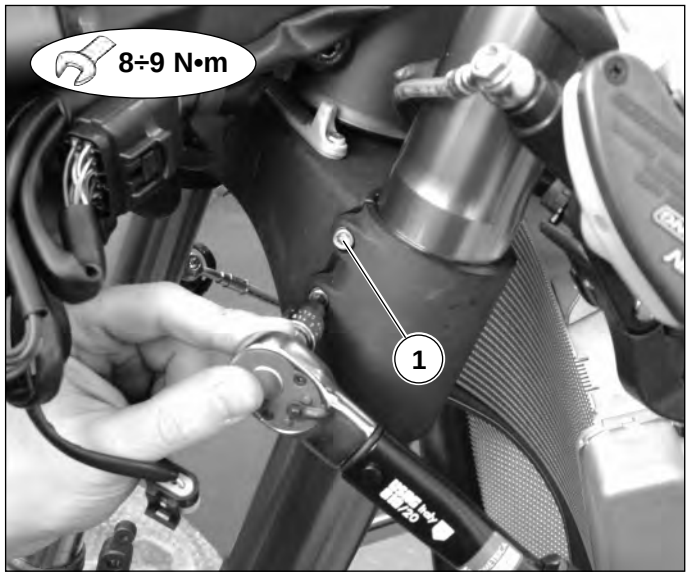
Right stem assembly

Reassemble the stem taking care to pass the electrical wiring and the accelerator controls inside the stem (between the stem and the steering head). Leave the brake tubing on the outside of the stem (see figure).
Lift up the stem until the third mark is in line with upper surface of the steering arm on the inside (see figure).

⚠ **Carry out this assembly correctly. A casual or inexact assembly could compromise the stability and steering of the motorcycle.**

Tighten the three screws (1) at the base of the steering. **Effectuate the operation several times until the torque wrench does not turn the screw any more**. This operation must be carried for both stems.

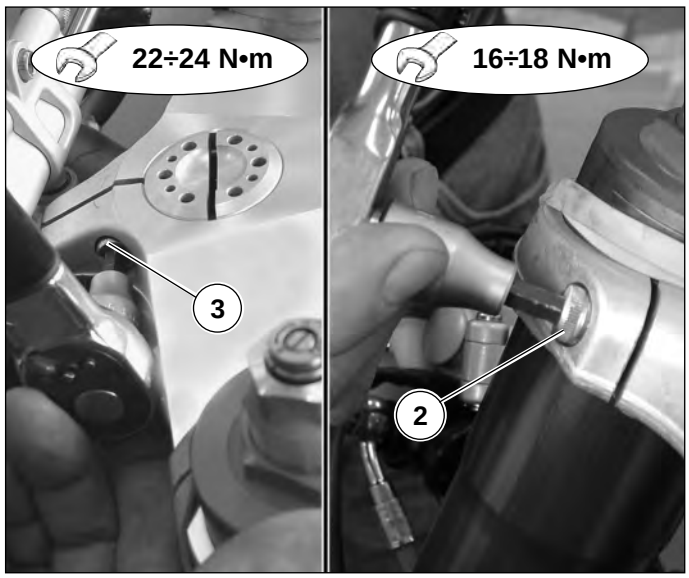
Torque pressure: 8 ÷ 9 N·m



Ensure that the steering head is sitting perfectly in its seat.
Tighten the two screws (2) of the steering head/stems to the prescribed torque pressure and successively tighten the central screw (3).

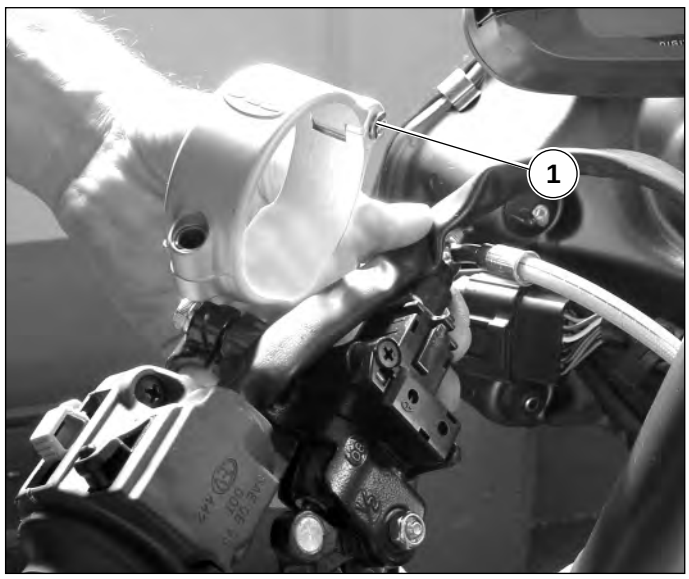
Torque pressure steering head (2):
16 ÷ 18 N·m
Torque pressure central screw (3):
22 ÷ 24 N·m

This check is necessary for the correct positioning of the stems even if the steering head has not been removed. This check guarantees the standard set-up of the motorcycle.



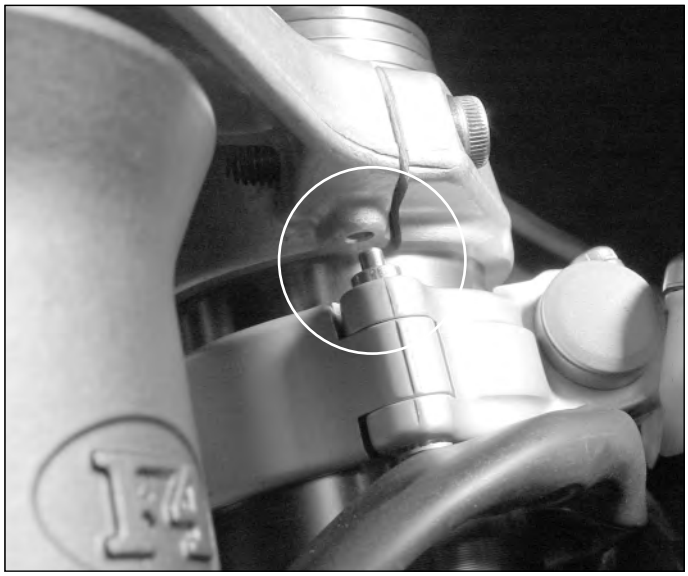
Assembly clip-on handlebars

Position the electrical wiring as shown in the figure. Ensure that the Seeger retaining ring (1) of the clamp pin is in good condition and in position.



F

Assemble the clip-on handlebar slotting the clamp pin into position on the steering head (see figure).



F

Tighten the screws (1) to the prescribed torque pressure.
After having carried out the assembly of the right clip-on handlebar, check that the accelerator handgrip rotates freely and smoothly.

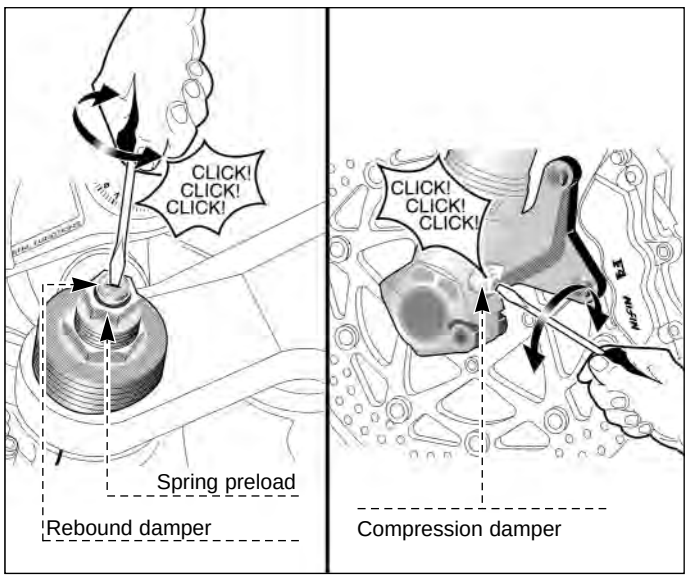
Torque pressure: 8 ÷ 10 N·m

Front suspension adjustment

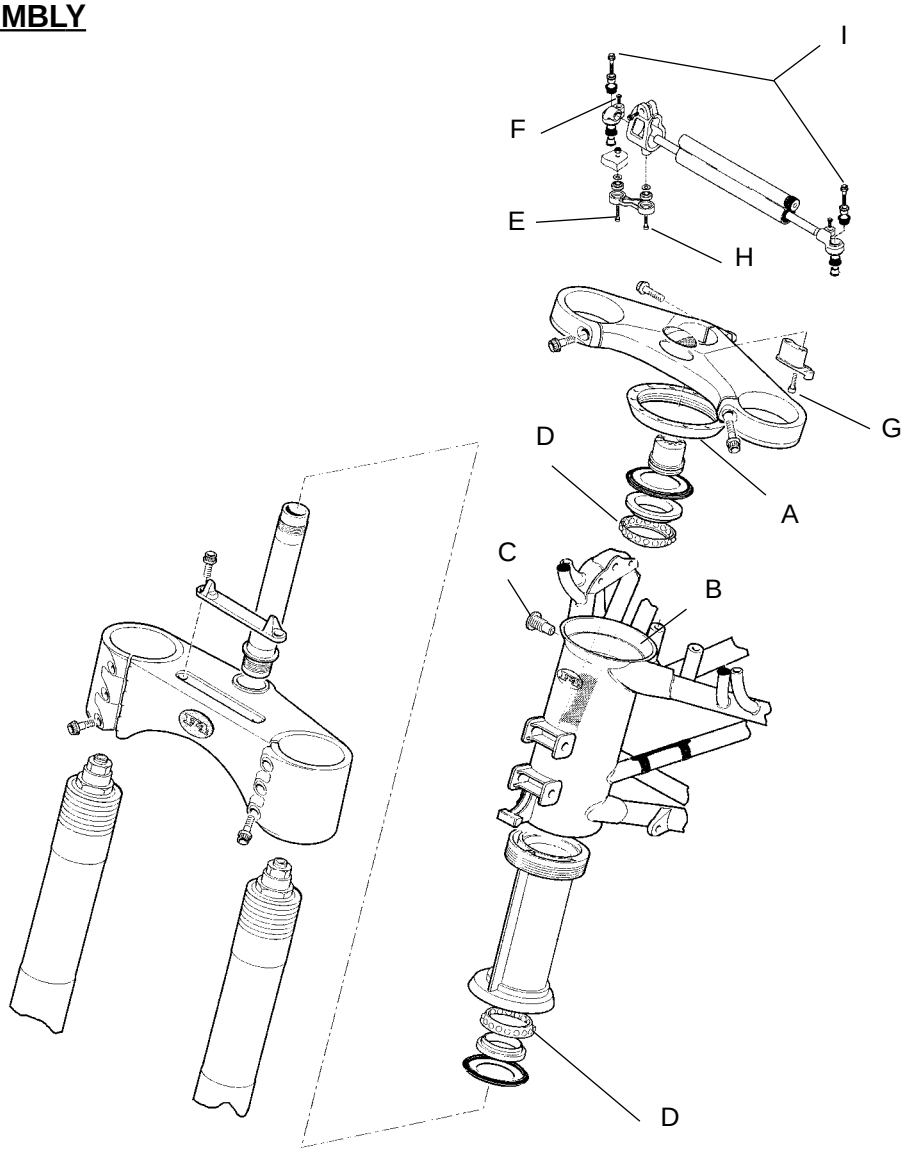
After having correctly reassembled the entire fork assembly, it is necessary to re-establish the adjustments shown in the table to guarantee the best set-up of the motorcycle.

Carry out the same identical adjustments on both stems of the fork.

	Type of set-up		
	Soft	*Standard*	*Hard*
Spring preload	6 marks	5 marks	4 marks
Braking in extension	7 clicks	5 clicks	3 clicks
Braking under compression	7 clicks	5 clicks	3 clicks



STEERING ASSEMBLY

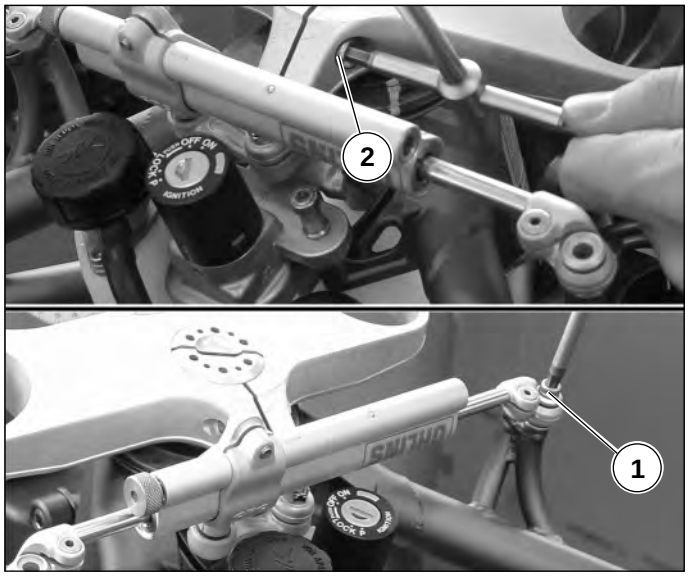


		A	B	C	D	E	F	G	H	I	L
Torque pressure	N·m	95 ÷ 100		18 ÷ 20		8 ÷ 10	8 ÷ 10	5 ÷ 7	8 ÷ 10	8 ÷ 10	
	Kg·m										
	ft·lb										
Operation						270		243	270		

STEERING ASSEMBLY OVERHAUL

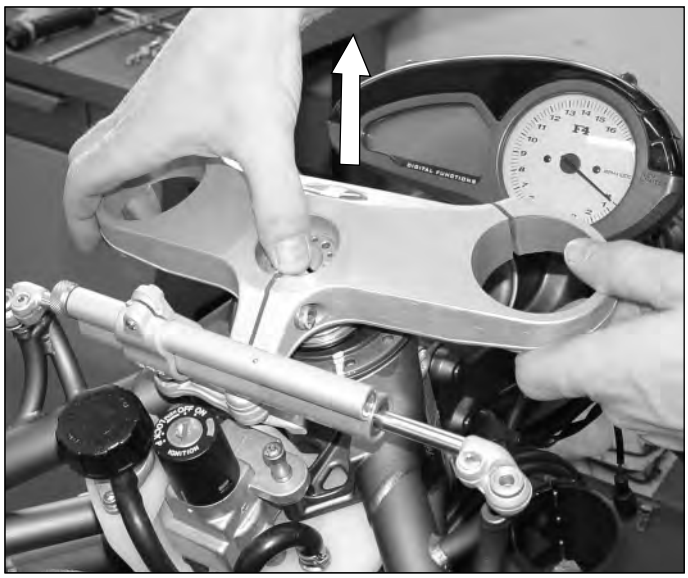
Steering head removal

After having previously removed the two stems of the fork assembly as previously described, remove the two fixing screws (1) of the steering shock absorber to the frame and successively the screw (2) that fixes the steering head to the steering pin.



F

Extract the steering base complete with shock absorber.

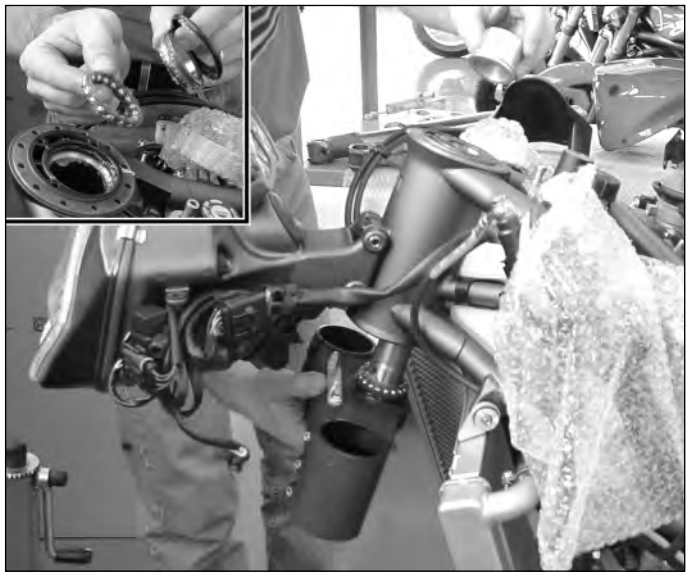


Steering base removal

Utilising the special tool, slacken the screw ring of the steering pin.
Support the motorcycle sufficiently enough so that the front stand can be removed. Ensure that the brake pincers are securely placed.

Special tool No. 800091645

Remove the screw ring previously slackened and remove the steering base complete with the pin.
Remove the anti-dust seal, the internal bearing ring and the ball bearing ring.

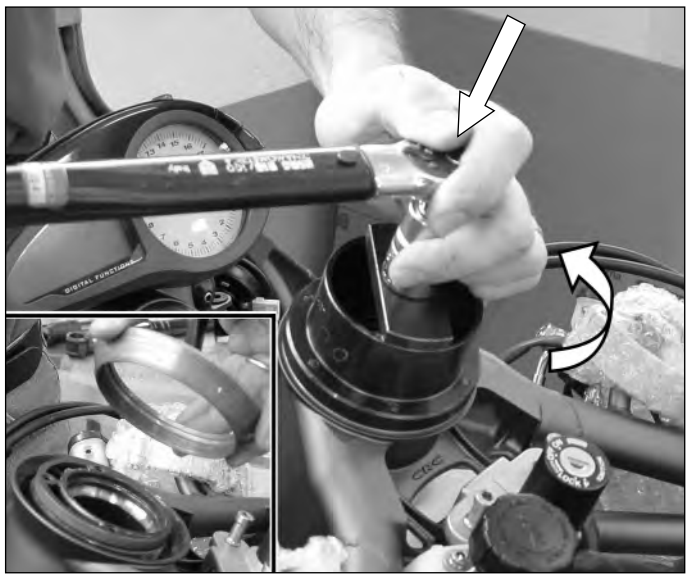


Disassembly of the frame head steering sleeve

Utilising the special tool, remove the steering screw ring

Special tool No. 800092857

⚠ **Attention! During this operation press the centre of the tool with the palm of the hand and at the same time supporting the motorcycle.**



Remove the adjustment screw of the frame head steering sleeve, sustaining the frame head steering sleeve at the lower part.

Reassembly of the frame head steering sleeve

Clean the parts accurately so that a visual check can be made of the tube and the seats.
There should not be marks or lines in the bearing seats. If so, substitute the parts as necessary.

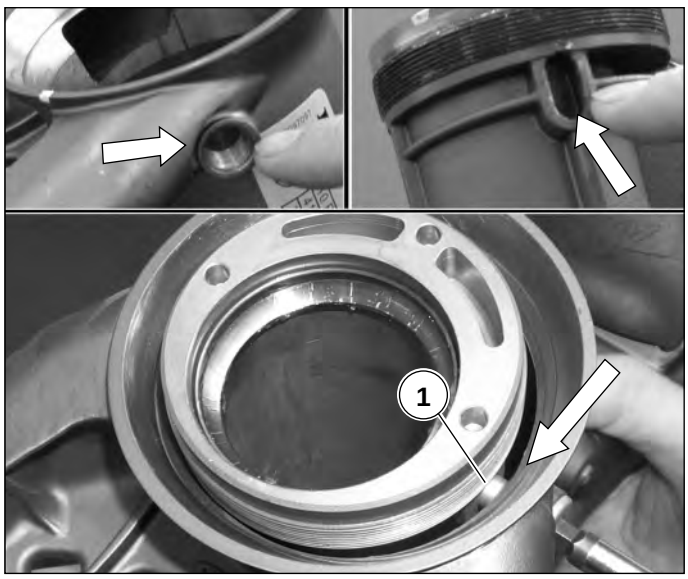
F

Lightly grease the contact area of the frame head steering sleeve (see figure) and the threaded part with Agip Grease 30.
Accurately clean the bearing seats on the frame head steering sleeve.

Recommended grease Agip Grease 30

Reassemble the frame head steering sleeve aligning the slot on the frame head steering sleeve with the threaded hole on the frame head (see figure).
When the slot is in correspondence with the threaded hole of the frame head screw in the grub screw (1), **without tightening**. Just enough to keep the steering head in its seat.

⚠ **The tightening of the grub screw (1) at this stage would compromise the set-up of the steering head in its frame seat.**



Screw ring assembly

After having accurately cleaned the screw ring and the seats of the steering head on the frame, grease the screw ring and screw it in manually onto the relative seat.

Recommended grease Agip Grease 30

Utilising the special tool, tighten the screw ring (1) to the prescribed torque pressure.

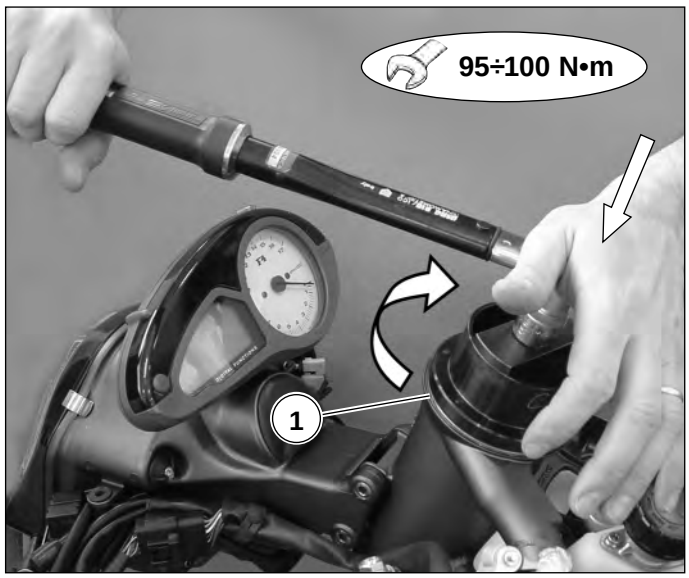
Special tool No. 800092857

Torque pressure: 95 ÷ 100 N·m

During this tightening operation, press down with force onto the head of the special tool.

Tighten the grub screw of the steering head.

Torque pressure: 18 ÷ 20 N·m



Assembly steering base

Accurately clean all the parts and check the general condition.
Before reassembly, grease the ball bearing ring and place it onto the steering pin.

Recommended grease: Agip Grease 30

Assemble the steering base to the frame.
Assemble the upper ball bearing ring already greased.
Assemble the internal ring of the bearing, the anti-dust seal and the upper screw ring.

F

Steering pin tightening

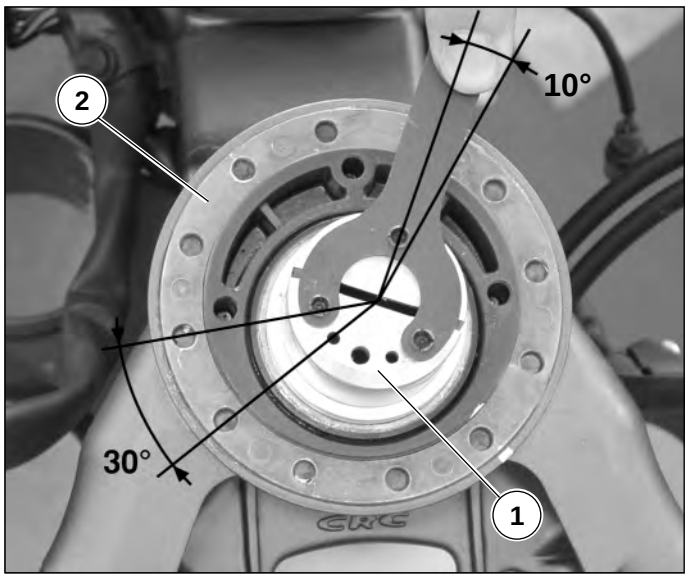
Screw down, without tightening, the screw ring of the steering pin.

This operation must be done manually.

Ensure that the steering base is turned as far as possible to the right.

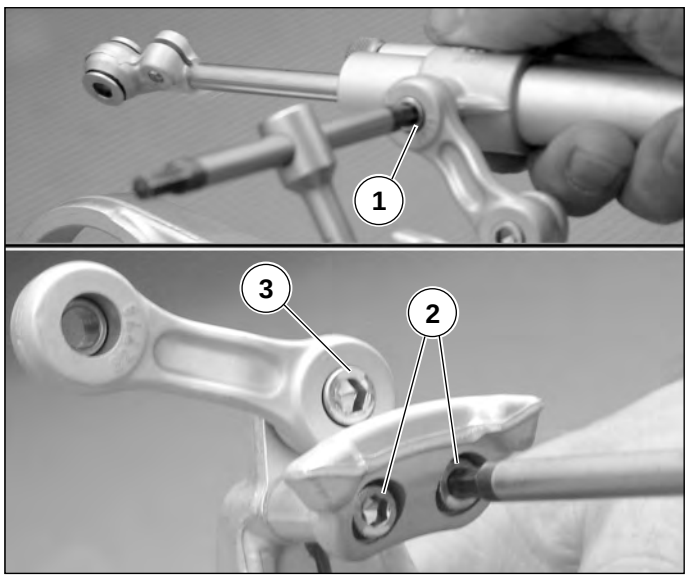
Utilising the special tool, tighten the screw ring (1) by rotating it 10° (see figure, calculable as one-third distance between the two holes of the steering head screw ring (2).

Special tool No. 800091645



Removal steering shock absorber connecting rod

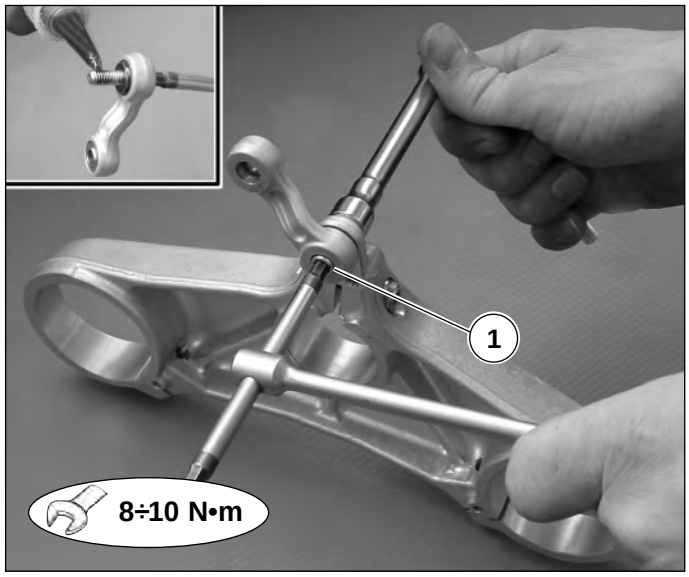
Remove the screw (1) that connects the connecting rod to the steering shock absorber.
Remove the two screws (2) of the steering lock block.
Remove the locknut of the screw (3) that connects the connecting rod to the steering head.
Check that the connecting rod is in good condition and that play is not present on the two bearings.
If play is found, substitute the worn parts with new ones.



Reassembly connecting rod

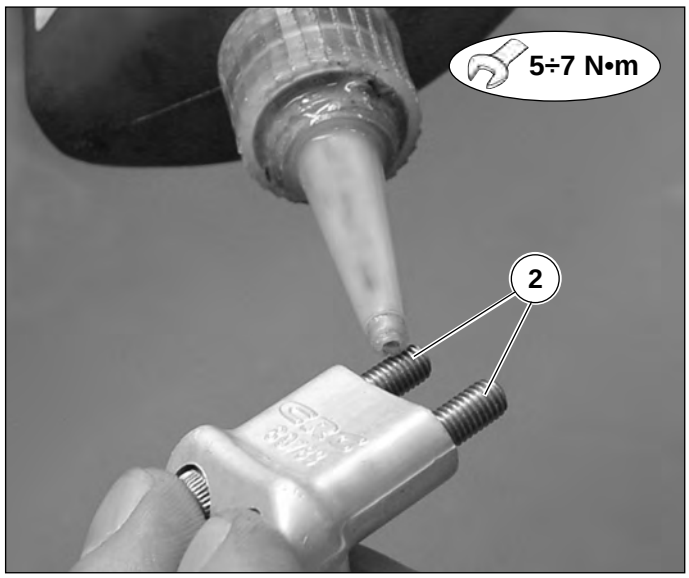
Apply Loctite 270 on the screw (1) that fixes the connecting rod to the steering head. Tighten the screw (1) to the prescribed torque pressure.

Torque pressure: 8 ÷ 10 N·m



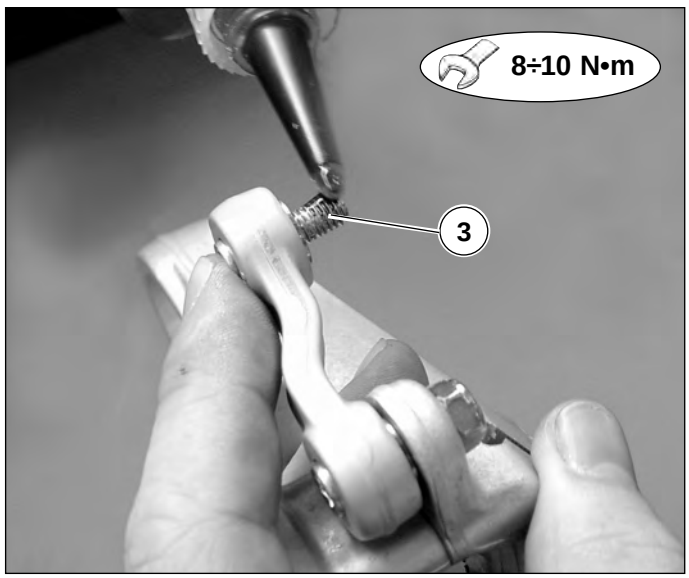
Apply Loctite medium 243 thread locking fluid on the two screws (2) of the steering lock block.
Tighten the two screws on the steering head to the prescribed torque pressure.

Torque pressure: 5 ÷ 7 N·m



Assemble the shock absorber to the steering head.
Utilise Loctite strong 270 thread-locking fluid to the screw (3).
Tighten the screw to the prescribed torque pressure.

Torque pressure: 8 ÷ 10 N·m



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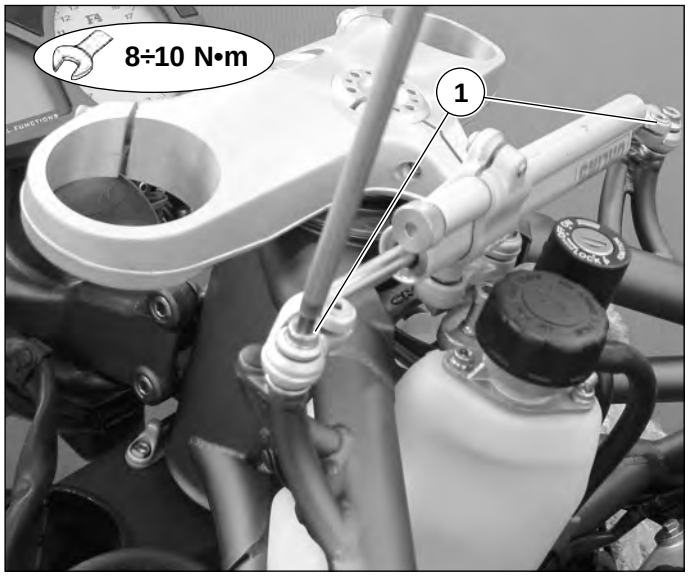
Assembly steering head

Position the steering head in its seat.
Fix the two fixings (1) of the steering shock absorber.
Reposition the fork stems as described previously in this chapter.

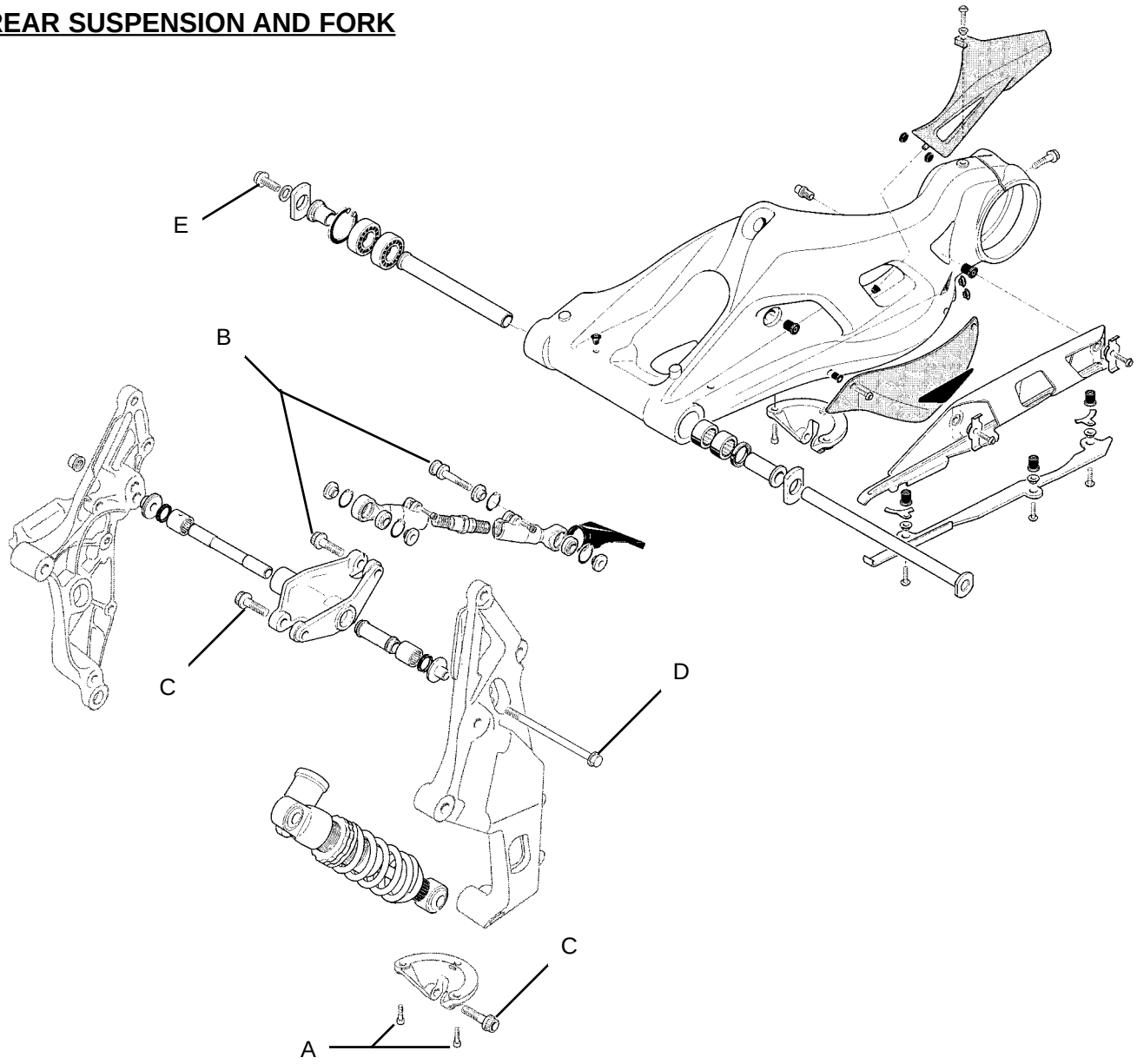
Torque pressure: 8 ÷ 10 N·m

Check the exact position of the fork stems.



F

REAR SUSPENSION AND FORK



		A	B	C	D	E	F	G	H	I	L
Torque pressure	N·m	40 ÷ 44	40 ÷ 44	40 ÷ 44	50 ÷ 55	70 ÷ 75					
	Kg·m										
	ft·lb										
Operation		243									

Description	F4 750 ORO	F4 750 S	F4 750 S (1+1)
REAR SUSPENSION			
Type	Progressive with mono-arm fork and mono-shock absorber adjustable for extension, compression and spring preload		
Mono-arm fork	Magnesium alloy	Aluminium alloy	Aluminium alloy
Wheel travel (mm)	120	120	120

During the disassembly and check of the rear suspension assembly, it is advisable to disassemble the under-engine fairing, fairing side panels, tail unit and fuel tank as described in chapter C "Bodywork".

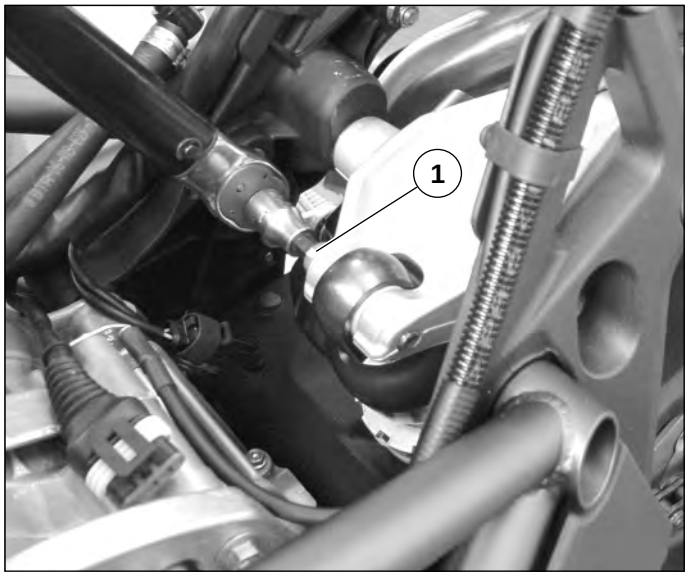
Disassembly rear shock absorber

Remove the tail unit as described in chapter C "Bodywork".

Remove the fuel tank as described in chapter B "Maintenance".

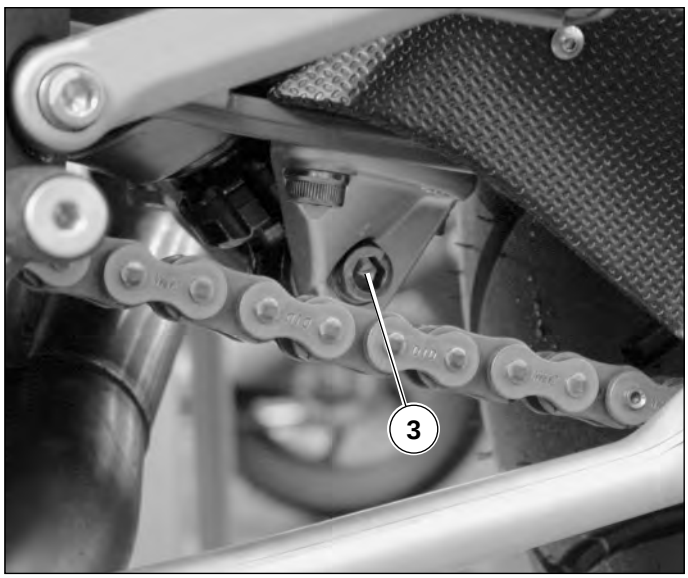
Lift up the rear part of the motorcycle (utilising a lift and safety straps) high enough to take the load off the shock absorber.

Slacken the upper screw of the shock absorber (1).

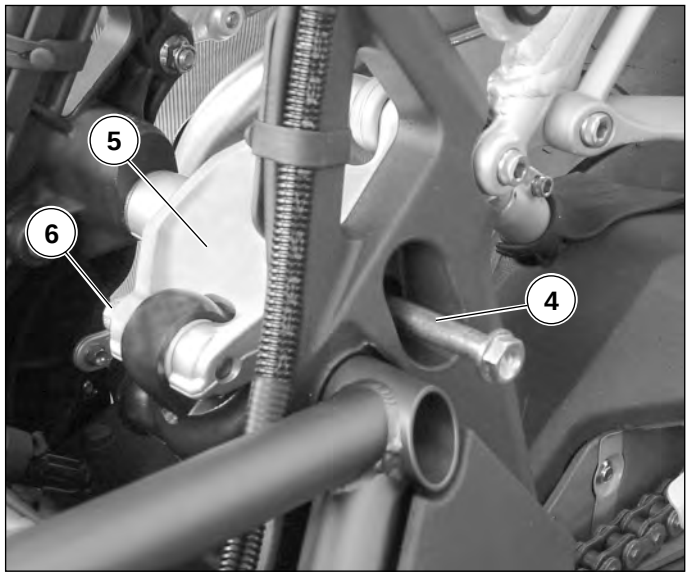


Slacken the central screw (2) of the rear wheel compensator assembly.

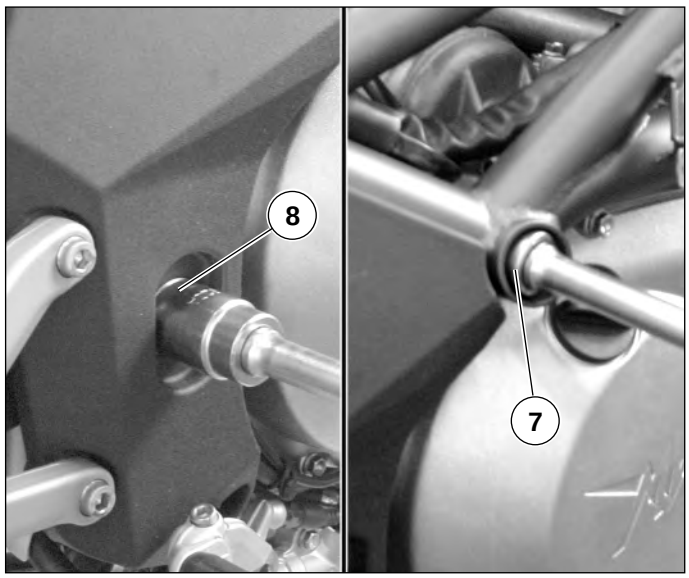
Slacken the lower screw of the shock absorber (3).



Raise up or lower the motorcycle utilising the lift so that the previously slackened screws are freed.
Remove the pin (4) of the compensator assembly (5).
Remove the upper screw of the shock absorber. (6).

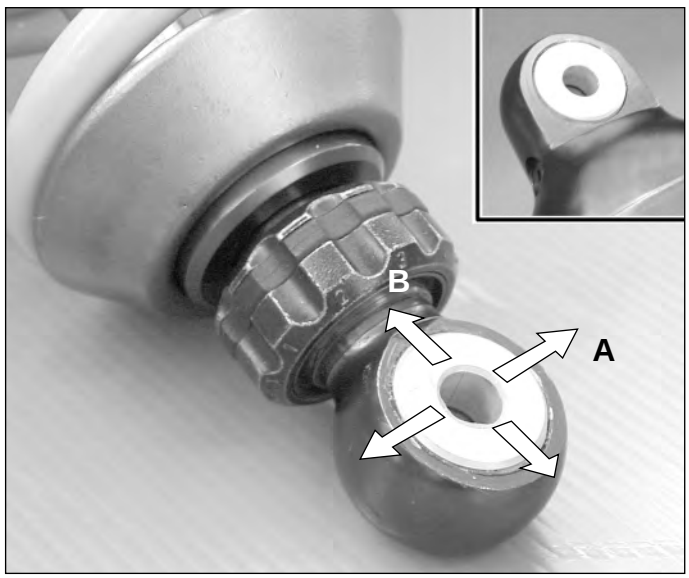


Slacken the central fixing pin of the engine (7).
Slacken the rear fork pin (8).
These operations are necessary to free the compensator assembly.
Lift up the compensator assembly.
Remove the upper screw of the shock absorber that was previously slackened.
Extract the rear shock absorber.



Rear shock absorber test

Check that the lower and upper bolt holes do not have axial (A) and radial (B) play.



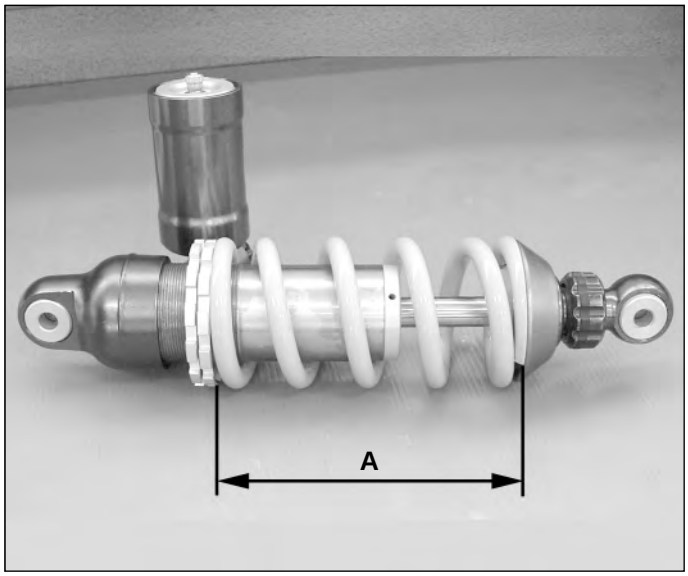
Check the length of the rear shock absorber spring.

Standard spring adjustment (A):

F4 ORO / F4 S *(to frame registration number 004145):* 154 mm
F4 S 1+1 / F4 S *(from frame registration number 004146):* 152 mm

Check the functioning of the adjusters.

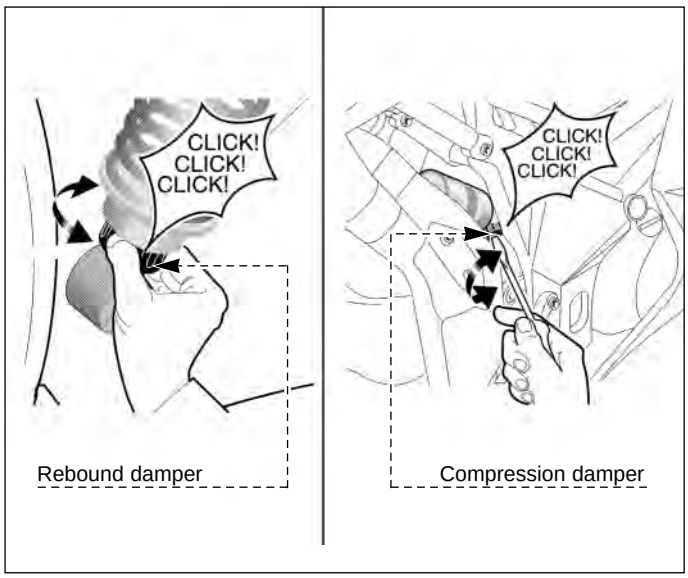
⚠ **The shock absorber contains high-pressure gas. Do not touch the valve of the shock absorber tank. Do not try to disassemble the shock absorber.**



Adjustments in extension and under compression of the rear shock absorber:

F

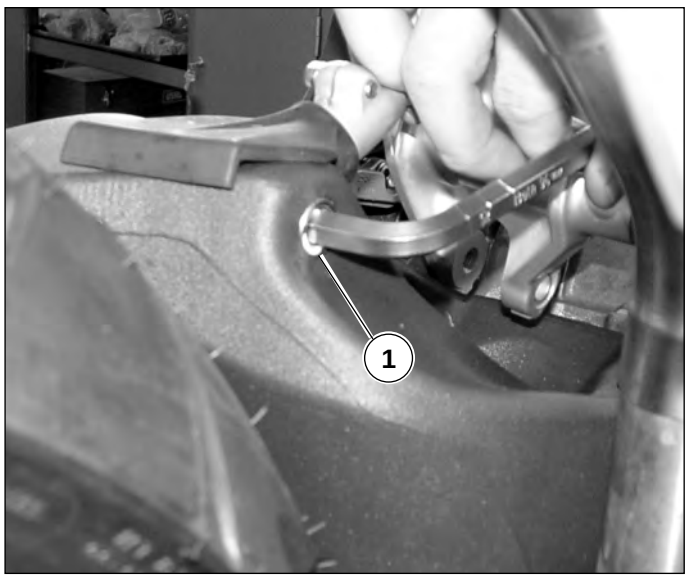
F4 ORO / F4 S (up to frame reg. No. 004145)	Type of set-up		
	Soft	*Standard*	*Hard*
Braking in extension	18 clicks	16 clicks	14 clicks
Braking under compression	16 clicks	14 clicks	12 clicks
F4 S1+1 / F4 S (after frame reg. No. 004146)	Type of set-up *(only rider)*		
	Soft	*Standard*	*Hard*
Freno in estensione	20 clicks	18 clicks	12 clicks
Braking under compression	22 clicks	20 clicks	15 clicks
F4 S1+1	Type of set-up *(with passenger)*		
	Soft	*Standard*	*Hard*
Braking in extension	14 clicks	12 clicks	9 clicks
Braking under compression	17 clicks	15 clicks	12 clicks



N.B. **This operation must be carried out with the shock absorber assembled to the motorcycle.**

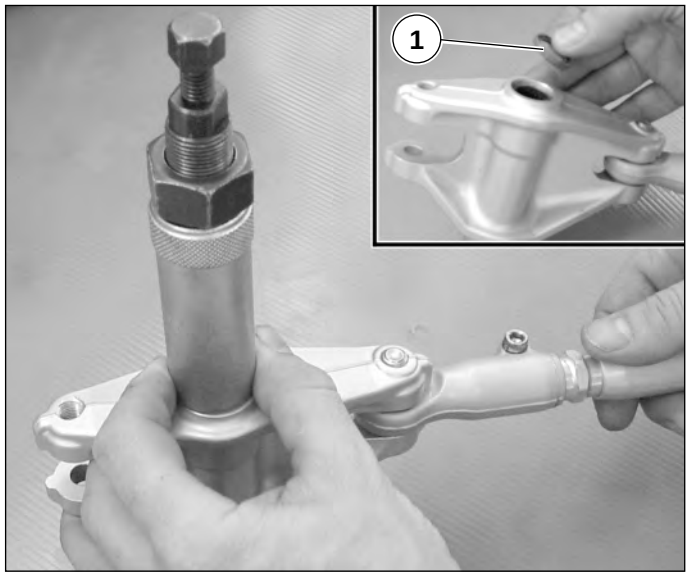
Compensator assembly removal

Remove the special screw (1) that fixes the compensator assembly of the rear suspension to the mono-arm fork.
Extract the complete compensator assembly.

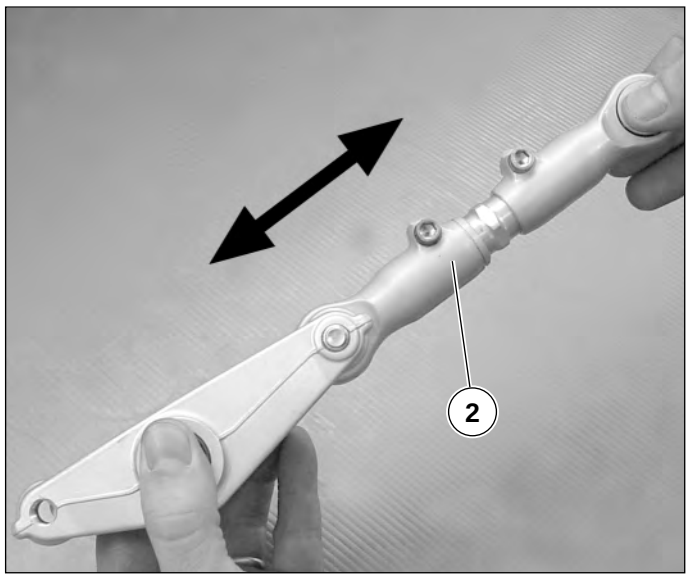


Compensator assembly overhaul

Remove the anti-dust seal (1).
Check the condition of the roller bearings and if it is necessary to substitute them, utilise an extractor as shown in the figure.

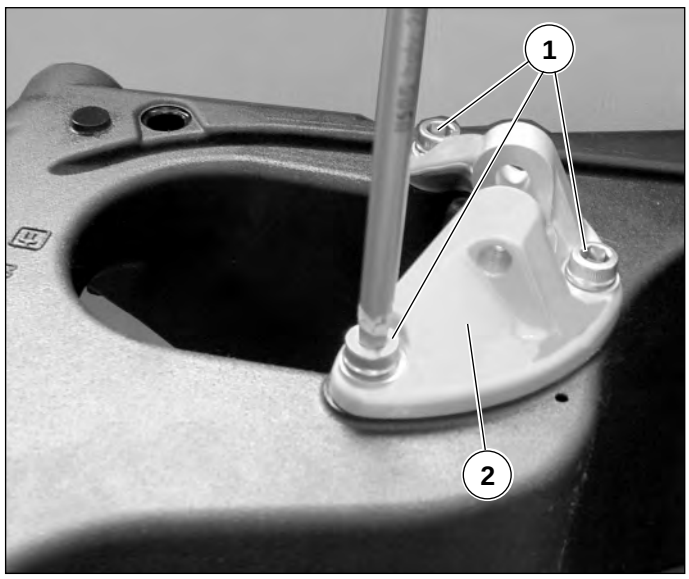


Check for eventual axial play of the bolt holes of the connecting rod (2).
Substitute if worn.



Rear shock absorber support plate removal

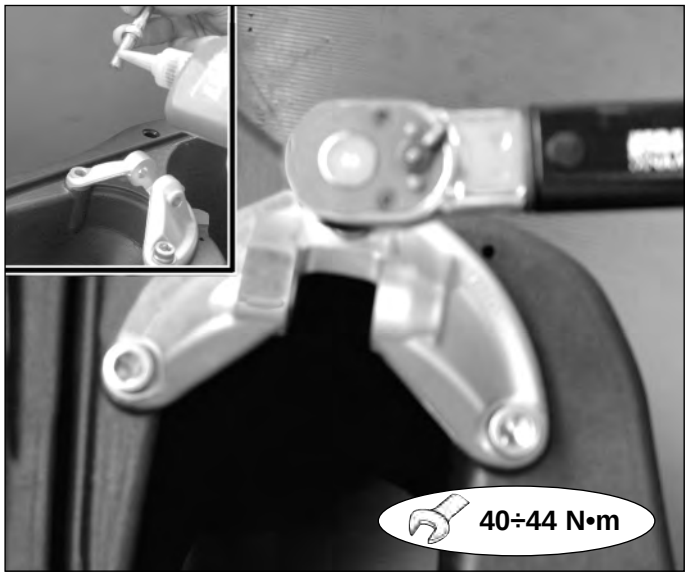
Remove the three screw (1) indicated in the figure and remove the support plate (2).



When reassembling, it is necessary to apply Loctite 242 to the three screws and lightly screw them in. Tighten the central screw first and then the other two to the prescribed torque pressure.

Special product: Loctite 242

Torque pressure: 40 ÷ 44 N·m

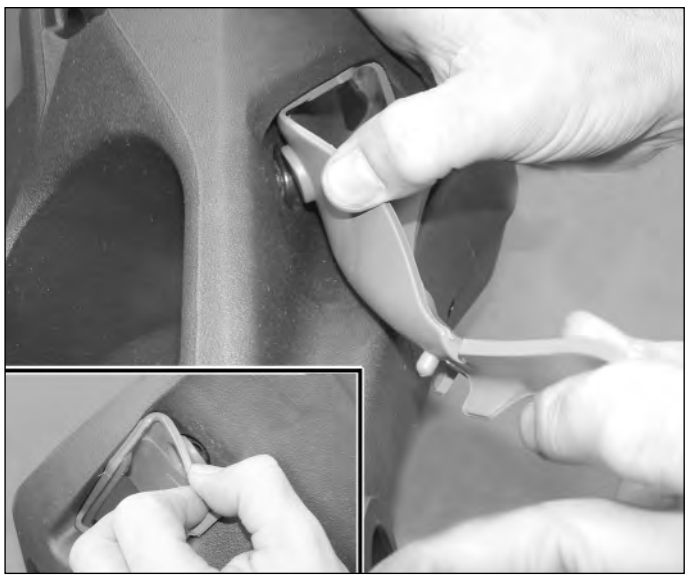


F

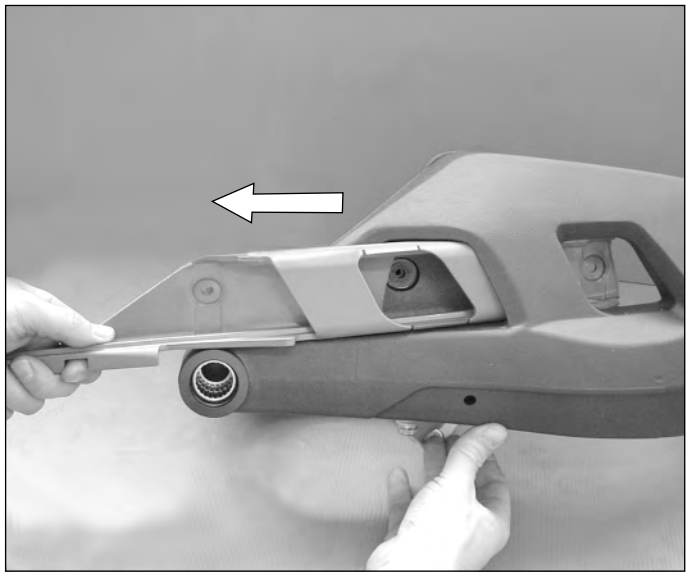
Upper chain guide removal

Remove the two screws (1) and the relative plates. Lift up the front part of the chain guide to remove it from the mono-arm fork (see figure).

Repeat the operation on the rear part, where the screw seat is situated in the mono-arm fork.



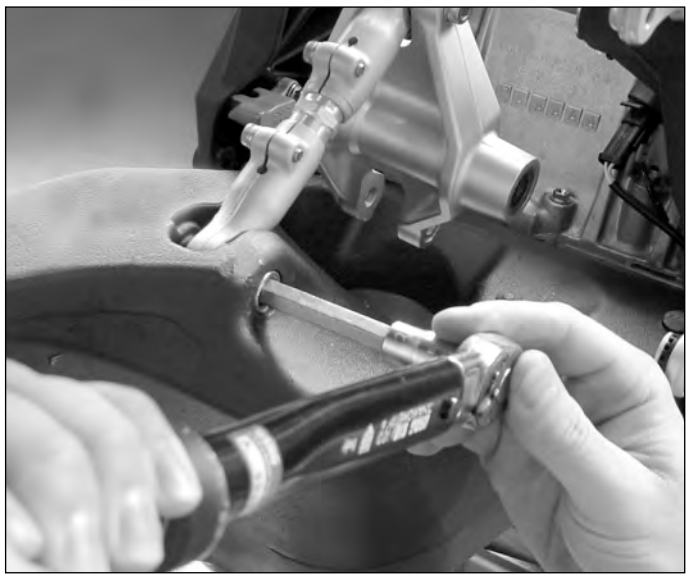
Slide out in a forward position as shown in the figure.
When reassembling, proceed in the reverse order of removal ensuring the correct positioning of the front reference peg.



Reassembly compensator assembly

Reassemble the compensator assembly after having cleaned and greased the seat of the special screw situated on the mono-arm fork.
Screw in the screw without tightening it.

Recommended grease : Agip Grease 30

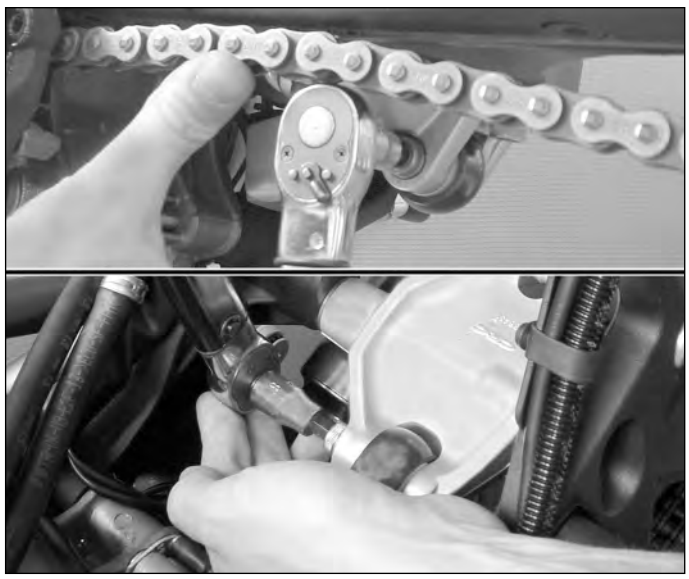


Assembly rear shock absorber

Accurately clean all parts. Grease the screws with Agip Grease 30 before reassembly.
Insert the shock absorber from above and lightly screw in the lower screw of the shock absorber.
Centralise the compensator assembly and replace the pin. Screw on the nut of the pin without tightening it.
Insert the shock absorber into the compensator assembly and lightly screw in the screw.

Lower the motorcycle to the ground, remove the lift and safety straps.
This operation is necessary to recover the play between the shock absorber/compensator assembly/mono-arm fork.

Recommended grease: Agip Grease 30

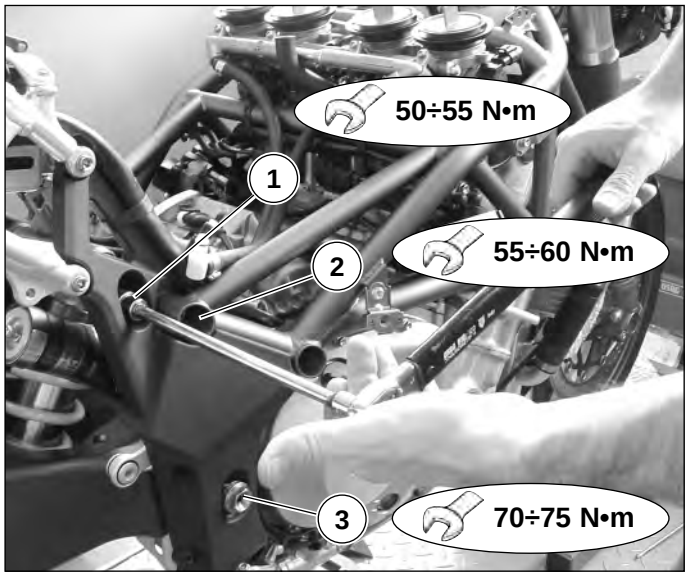


Tighten up the whole assembly:
Tighten the screws of the connecting rod
Tighten the lower and upper screw of the shock absorber.
Tighten the screw of the compensator assembly (1).
Tighten the frame pin (2).
Tighten the mono-arm fork pin (3).

Apply Agip Grease 30 only to the threads of the screws.

Connecting rod torque pressure: 40 ÷ 44 N·m
Shock absorber torque pressure: 40 ÷ 44 N·m
Compensator assembly torque pressure: 50 ÷ 55 N·m
Frame pin torque pressure: 55 ÷ 60 N·m
Mono-arm fork torque pressure: 70 ÷ 75 N·m

Recommended grease: Agip Grease 30



F

MONO-ARM FORK REMOVAL AND OVERHAUL

Remove the rear shock absorber and connecting rod.

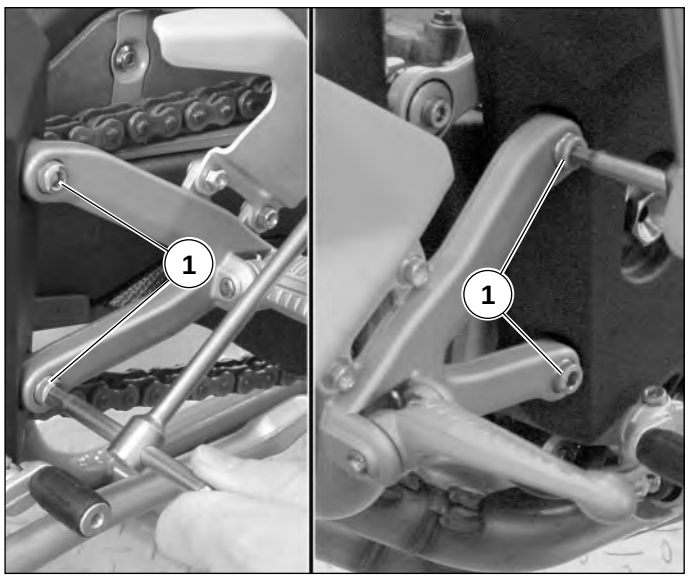
Rear wheel removal

Remove the safety spring clip (1) and unscrew the screw ring of the wheel.

Attention! The screw ring has a left-handed thread.

Footrest removal

Unscrew the two screws (1) of both footrest supports and remove them.



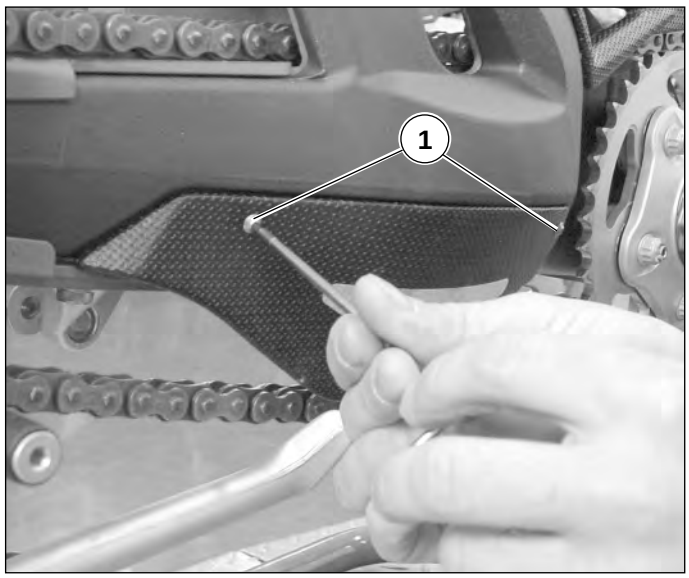
SILENCERS AND EXHAUST GROUP REMOVAL

Right passenger footrest removal

It is necessary to remove the right passenger footrest on all rider + passenger motorcycles to carry out the removal of the silencers and the exhaust group. Remove the right passenger footrest by unscrewing the two relative screws.

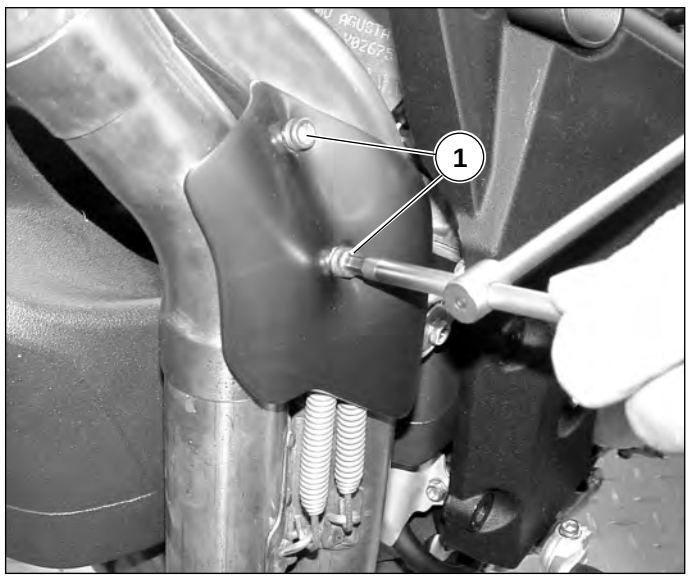
Lower chain guard removal

Remove the two socket head screws (1) of the lower chain guard.



Anti-heat protection removal

Remove the two screws (1) that fix the protection onto the exhaust group.



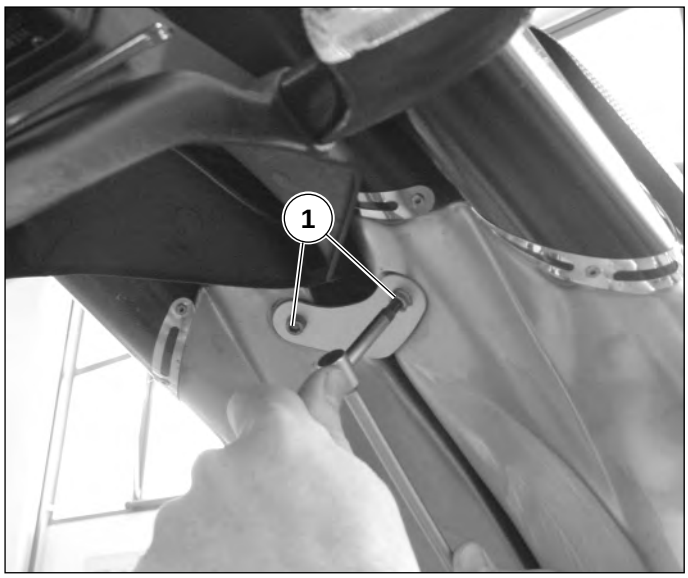
Removal silencers

Unhook the two connecting springs between the silencers and the exhaust group.
Unhook the two connecting springs between the primary exhaust tubes and the exhaust group.

⚠ **This operation must be carried out utilising and adequate tool to avoid the spring from bouncing dangerously.**

F

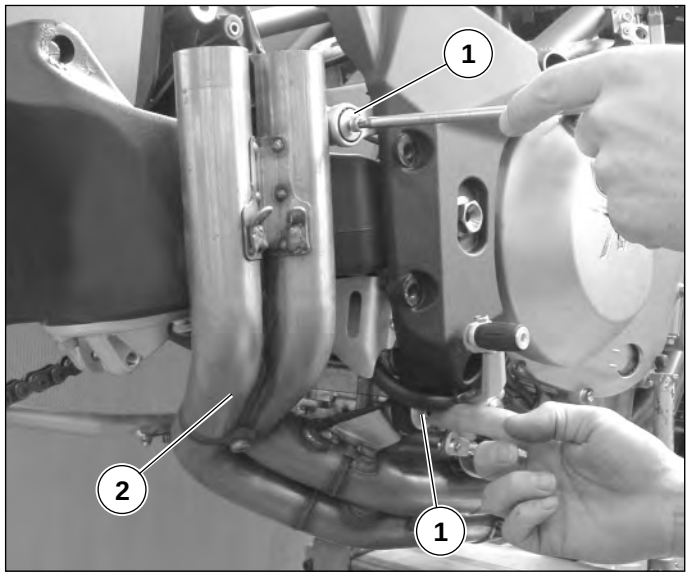
Remove the lower connecting plate of the exhausts by unscrewing the two screws (1).



Remove the two lateral screws (see figure) that fix the exhausts and remove the two silencers.

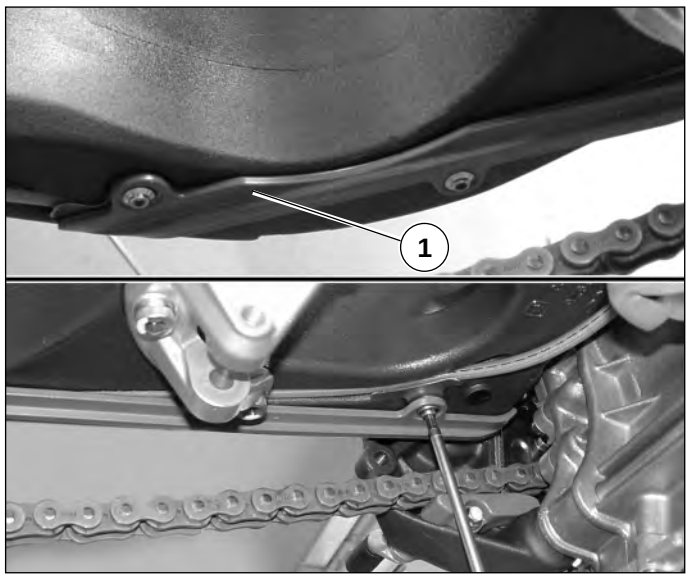
Exhaust group removal

Remove the two screws (1) as shown in the figure and remove the exhaust group (2).



Lower chain guide removal

Remove the three screws of the chain guide.
Remove the chain guide (1) complete with the two rear brake tube guide plates.



Upper chain guard removal

Remove the screw complete with ferrule.
Extract the chain guard by pulling it out from the back part of the wheel (see figure) so that it is freed from its position on the mono-arm fork.

Chain removal

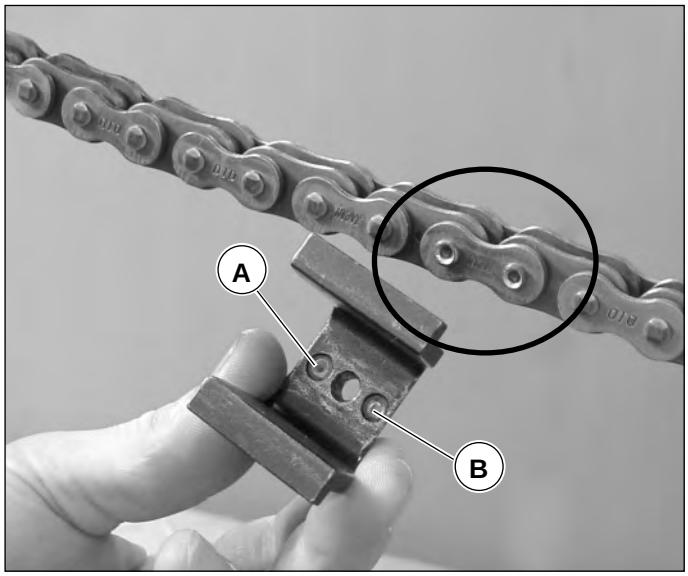
Remove the chain utilising the special tool.

Special tool no. 800095389.

Identify the connecting link.

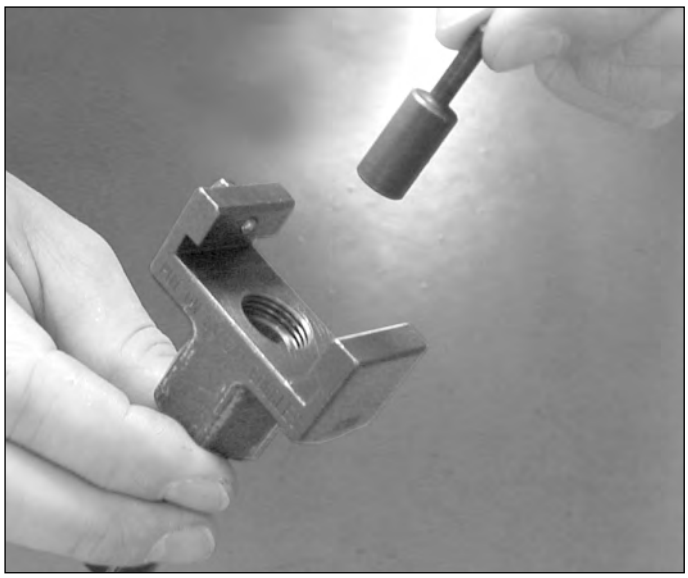
N.B. **The tool has two functions:**

- **As a chain cutter: with a punch mounted aligned at A.**
- **As an anvil: with a raised punch aligned at B.**

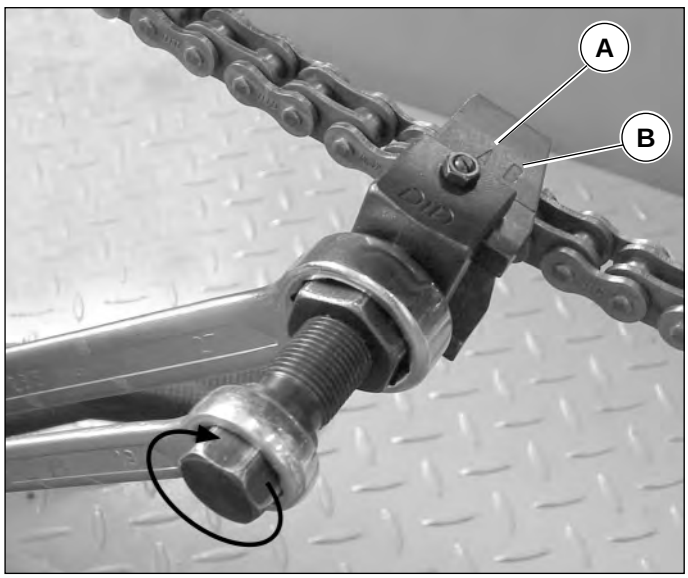


F

Pre-assemble the tool as shown in the figure.
Align a pin with the central hole of the tool.



Mount the tool onto the chain as shown in the figure and align the punch on «**A**».
Operate as shown in the figure.

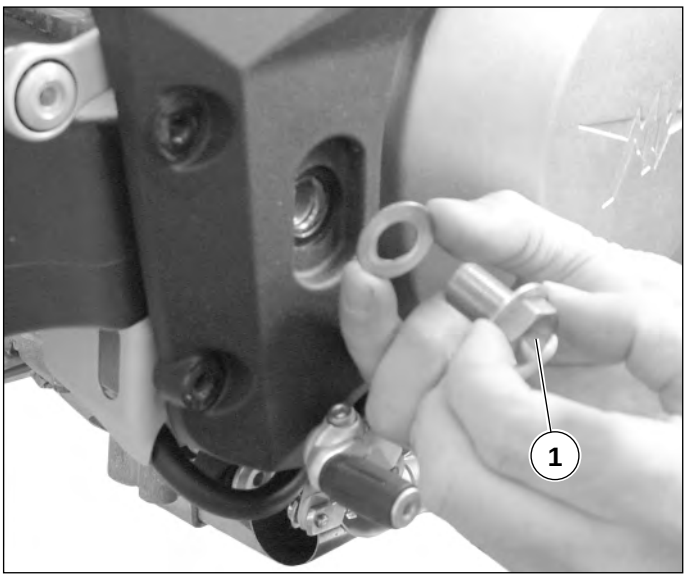


To reassemble the chain, operate in the reverse order of removal, mounting the tool with the punch as shown in the figure, aligned with «**A**».

⚠ **Utilise only new links.**

Mono-arm fork pin removal

Remove the screw (1) on the right side of the motorcycle.
Remove the washer and push out the pin **manually**.
Support the mono-arm fork so that it does not drop to the ground.



Bearings overhaul

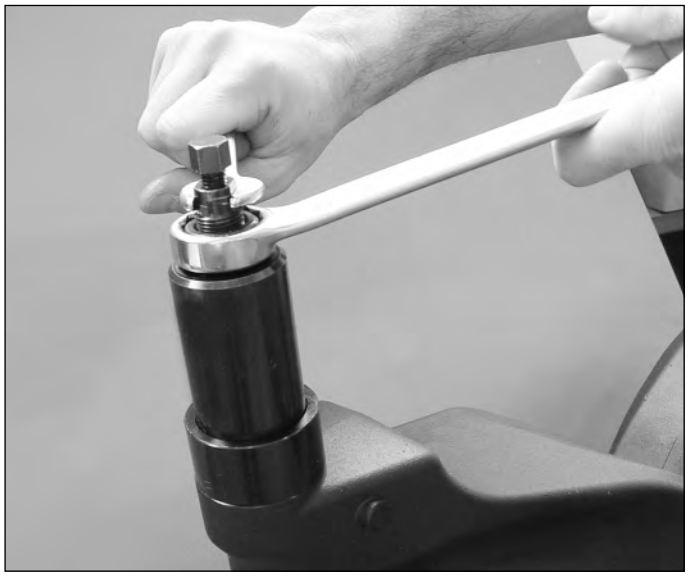
If it is necessary to substitute the bearings of the mono-arm because of excessive play, operate as follows:
Remove the right and left spacer.
Remove the Seeger retaining ring on the right side of the mono-arm.
Remove the anti-dust seal on the left side.
Utilising the special tool, remove the two roller bearing units.

Special tool no. 800092860 LEFT SIDE

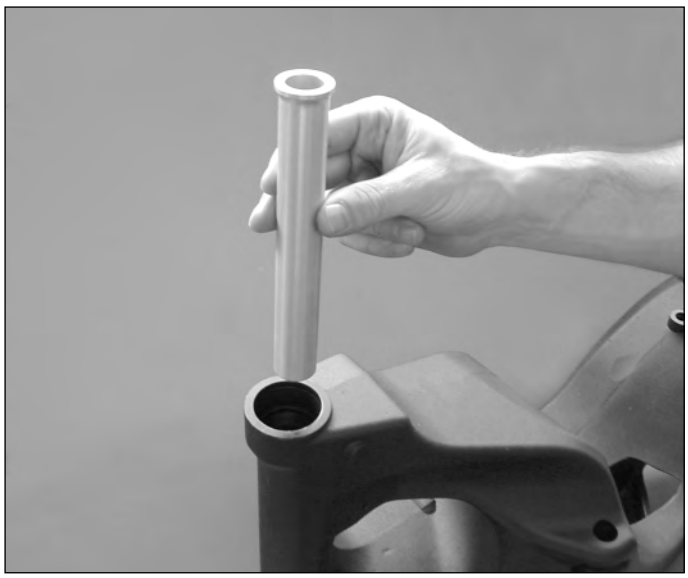
Mount the tool so that both roller bearings are removed.

Utilising the special tool press on both ball bearings and extract them.
Operate in the same way for the bearings on the left side.

Special tool no. 800092860 RIGHT SIDE



Extract the spacer from the right side.

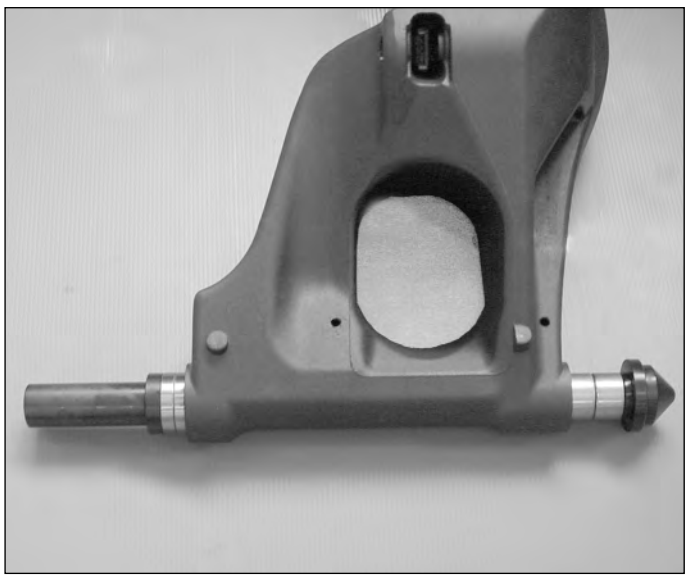


Check the condition of both bearing seats and the seat of the spacer.
If the spacer is in good condition, reinsert it onto the fork from the right side.

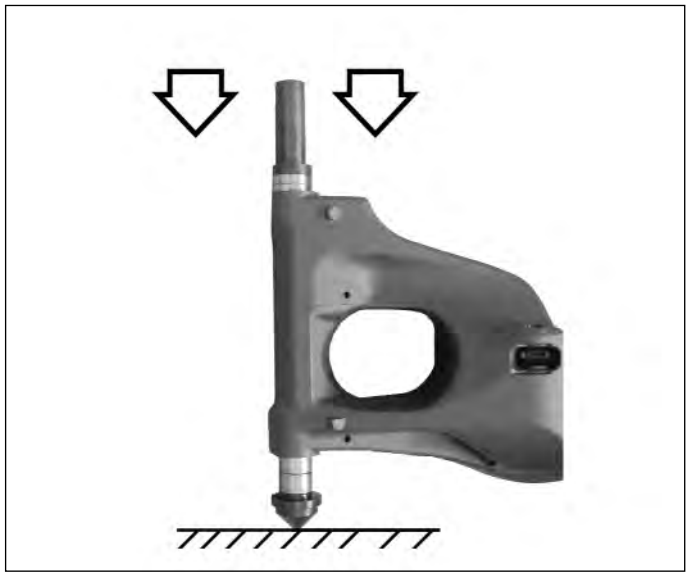
Assembly of the roller bearings and the roller bearing units

Pre-assemble the two roller bearing units on the left side and the two ball bearings on the right hand side utilising the special tool (**no. 800092866)** as shown in the figure. Use new parts.

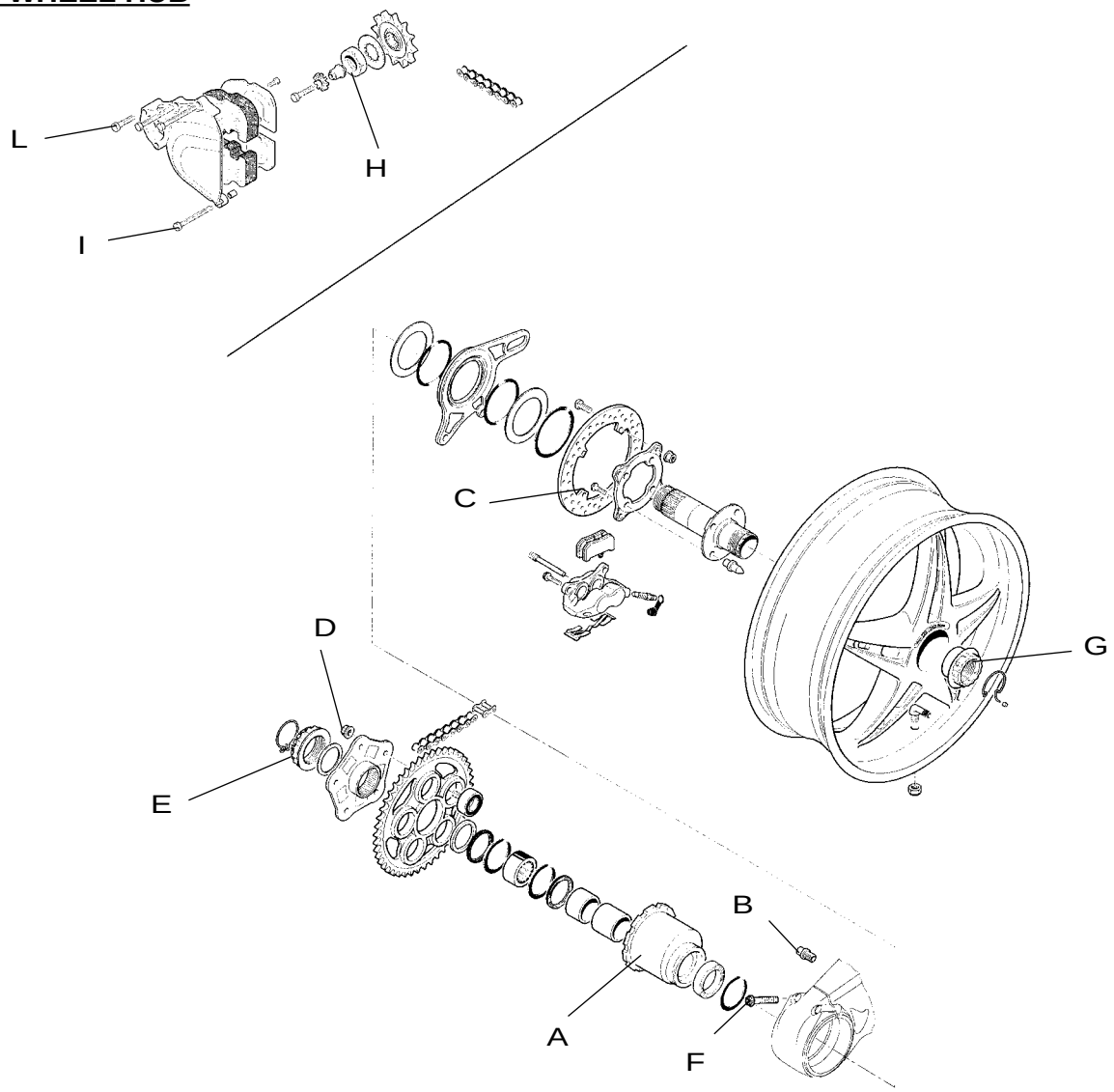
Special tool no. 800092866



Utilising a press fit the bearings and the roller bearing units (see figure).



REAR WHEEL HUB



		A	B	C	D	E	F	G	H	I	L
Torque pressure	N·m		30 ÷ 35	20 ÷ 22	45 ÷ 50	200÷220	28÷32	220 ÷ 240	100	25	8
	Kg·m										
	ft·lb										
Operation			270		270				270		

Description	F4 750 ORO		F4 750 S	F4 750 S (1+1)
REAR WHEEL				
Material	Magnesium alloy		Aluminium alloy	Aluminium alloy
Dimensions	Standard 6,00” x 17”	Optional 5,75” x 17”	6,00” x 17”	6,00” x 17”
REAR TYRE				
Dimensions	190/50-ZR 17 or 180/55-ZR 17		190/50-ZR 17 or 180/55-ZR 17	190/50-ZR 17 or 180/55-ZR 17
Brand and type	PIRELLI - Dragon Evo MTR22 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica		PIRELLI - Dragon Evo MTR22 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica	PIRELLI - Dragon Evo MTR22 Corsa METZELER - MEZ3 Racing MICHELIN - Pilot Sport DUNLOP - Sport Max D 207 Race Replica
Rear tyre pressure	PIRELLI-METZELER 2.3 bar (33 psi), MICHELIN 2.4 bar (35 psi), DUNLOP 2.3 bar (33 psi)			

Before checking and overhauling the rear wheel hub assembly it is necessary to carry out the following preliminary operations:

Place the motorcycle on the rear stand.

Special tool no. 800092642

Remove the rear wheel by removing the polygonal nut. Utilise the following tools:

- **Torque wrench**
- **55 mm polygonal spanner**

The polygonal fixing nut of the rear wheel has a left hand thread. To effectuate the removal it is therefore necessary to turn the torque wrench in a clockwise direction as shown in the figure.

After having effectuated the rear wheel removal, support the motorcycle with a lift as shown in the figure. Remove the rear stand.

Remove the safety ring of the crown flange-fixing nut.

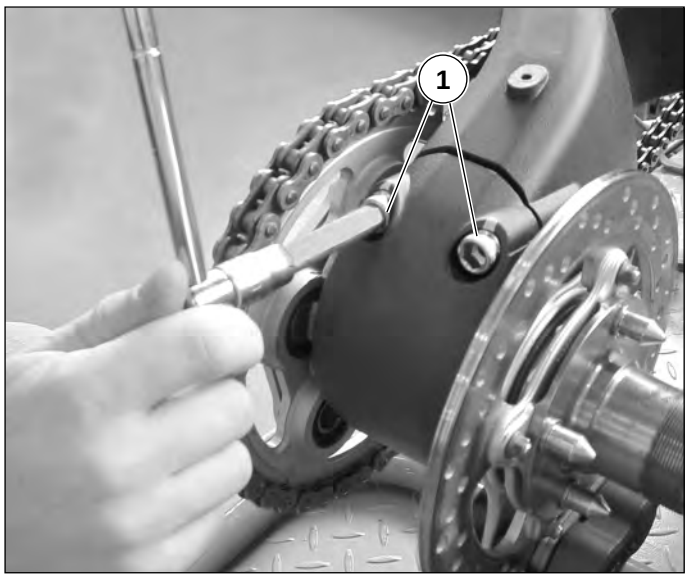
F

Slacken the nut of the flange by rotating it in an anti-clockwise direction as shown in the figure. Utilise the following tools:

- **Torque wrench**
- **55 mm polygonal spanner**

Remove the brake caliper (see chapter H "Brakes").

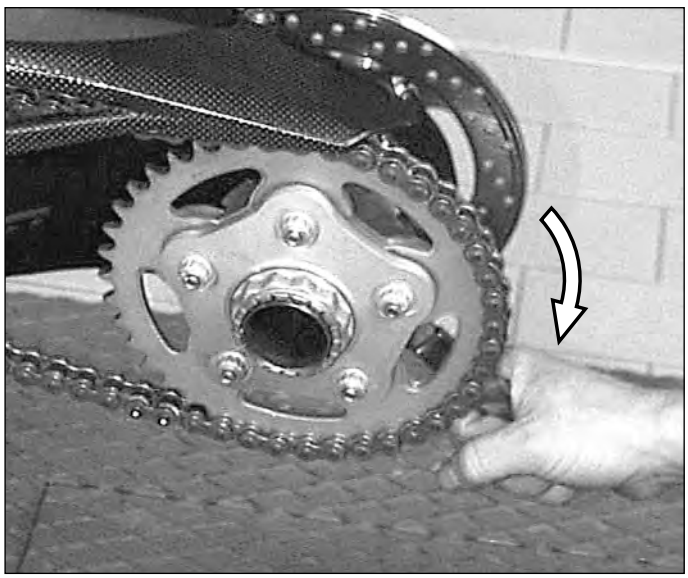
Slacken the fixings (1) of the wheel hub.



With the special spanner mounted on the extension tube, pull forward the eccentric adjuster and release the chain from the crown wheel.

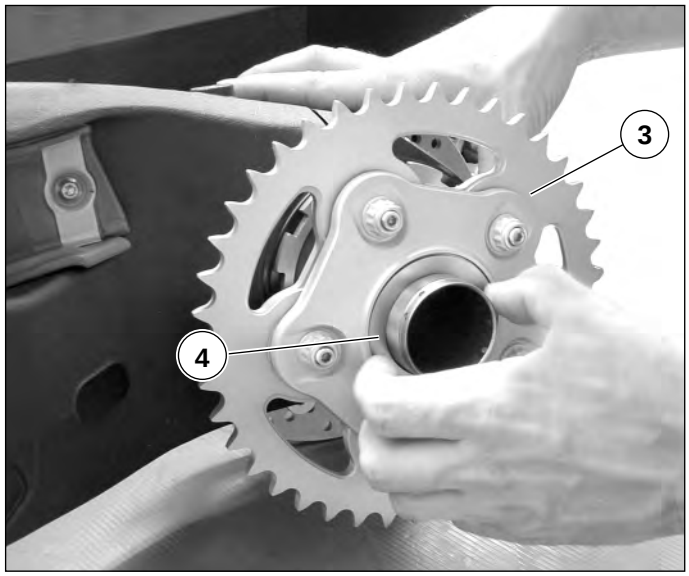
Special tool:

Eccentric adjuster spanner	**no. 800092854**
Spanner extension	**no. 800092855**



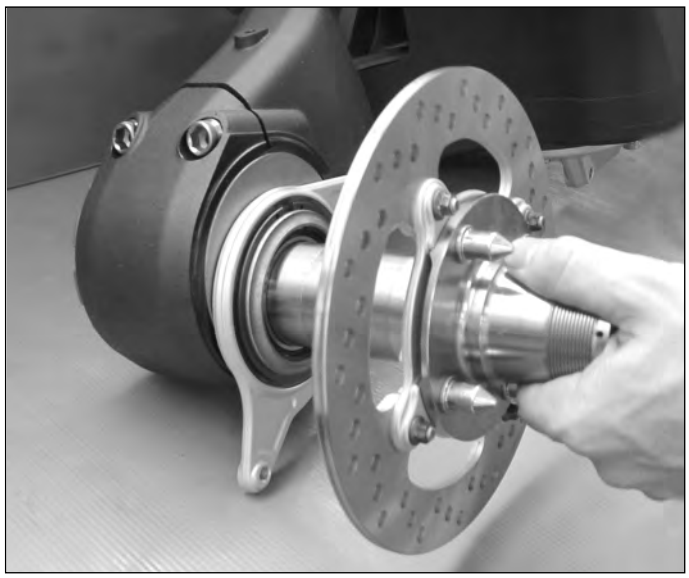
Crown wheel assembly removal

Remove the retaining ring (1).
Remove the wheel spindle nut (2) previously slackened. Remove the crown wheel assembly (3) and the spacer ring (4) underneath.



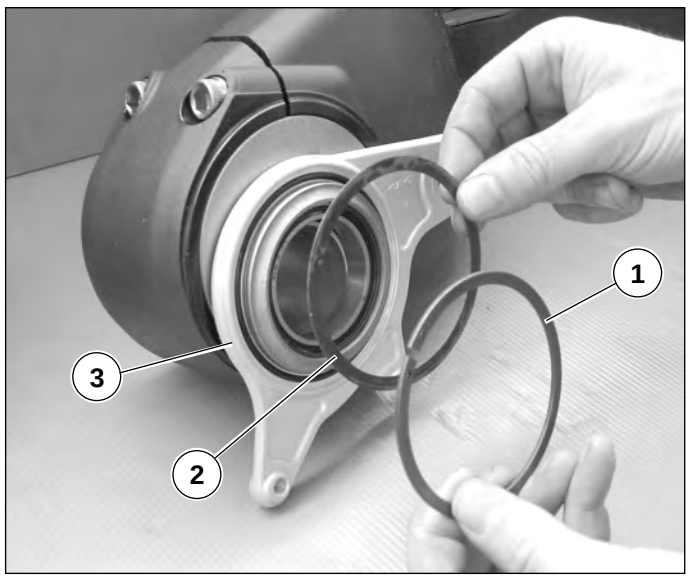
Wheel spindle removal

Remove the wheel spindle complete with the brake disc, extracting it from the right side of the motorcycle as shown in the figure.



Pincer carrier flange removal

Remove the Seeger retaining ring (1), the spacer ring (2), the flange (3) and the spacer ring underneath.



Wheel hub disassembly

Extract the wheel hub from the left side of the fork.
Carefully wash all parts.
Check the condition of the roller bearing and the ball bearing
If there is excessive play, even in only one of the bearings, substitute the wheel hub, complete with bearings with a new unit.

⚠ **If only one bearing is worn, substitute the complete unit. Never substitute one bearing only.**

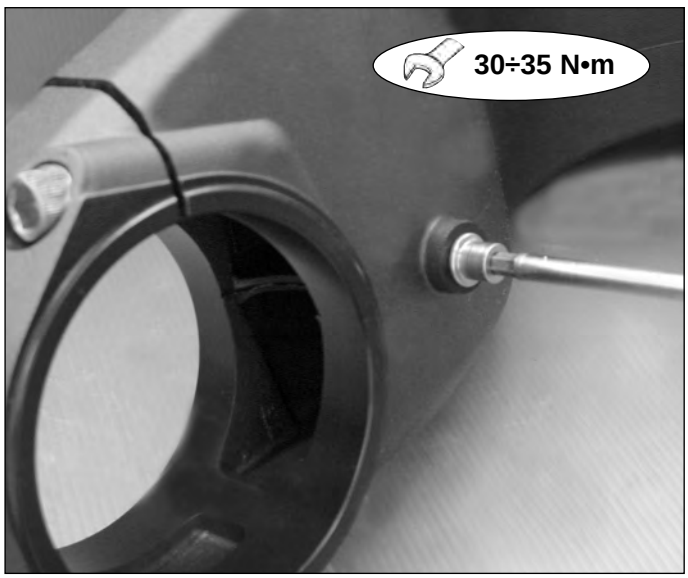
F

For normal maintenance, remove the two internal spacers (wheel spindle seat), wash the roller bearing units, dry them and grease them.
Check the condition of the ball bearings.

Recommended grease:
– Agip GR MU3 (F4 ORO)
– Molykote BR2 PLUS (F4 S - S 1+1)

Caliper holder pin

N.B. Unscrew the caliper holder pin only if it is damaged.
When reassembling, apply Loctite 242 as prescribed and tighten to the correct torque pressure.

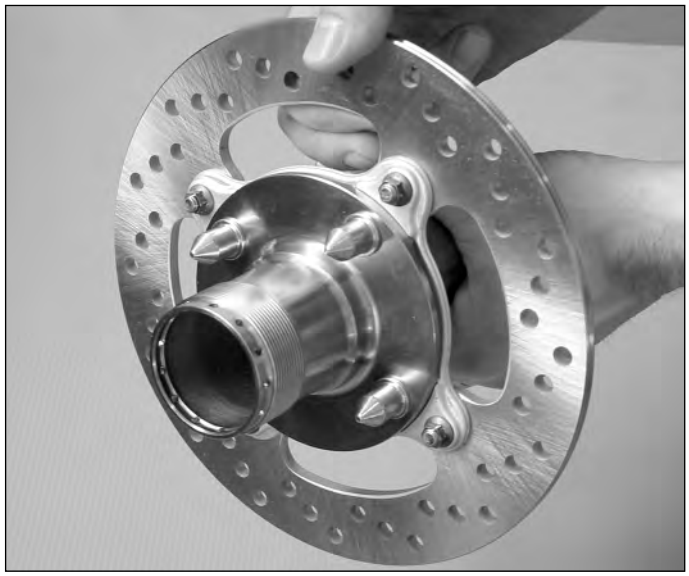


Recommended thread-locking fluid: Loctite 242

Torque pressure: 30 ÷ 35 N·m

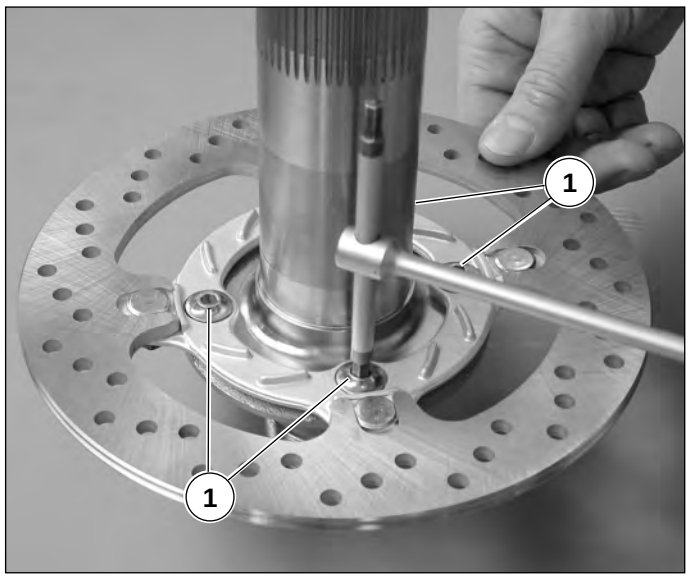
Wheel spindle unit check

Check the condition of the wheel drive engagement splines.
If it is worn, substitute as follows.

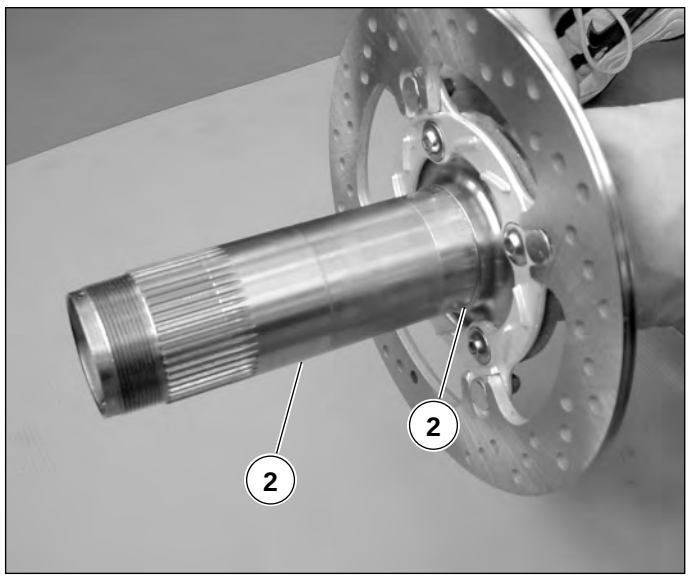


After having heated them, remove the four brake disc carrier flange fixing screws (1) mounted with Loctite 270.
Remove the flange.

Recommended thread-locking fluid: Loctite 270



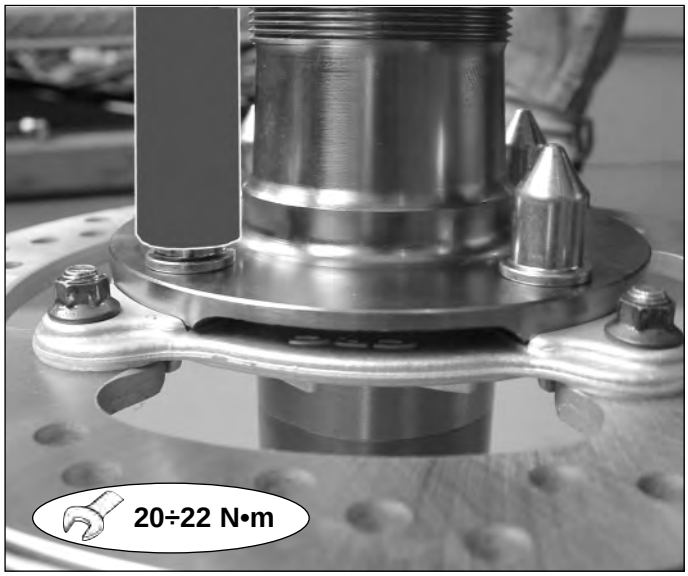
Check the extra-smooth parts of the wheel spindle for wear (2).



Utilising a press with an adequate punch for both the removal and assembly of the pins of the wheel drive engagement.
When assembling, apply force on the crown of the peg not on the point. (see figure).
Assemble the brake disc carrier plate by tightening the screws to the prescribed torque pressure and then apply Loctite 270.

Recommended thread-locking fluid: Loctite 270

Torque pressure: 20 ÷ 22 N·m



F

Check

Evaluate the wear condition of the crown wheel. If it is badly worn, effectuate a substitution with a new part.

Slacken the five Silentblock and if necessary substitute them.

When reassembling, grease the area that comes into contact between the flange and the crown.

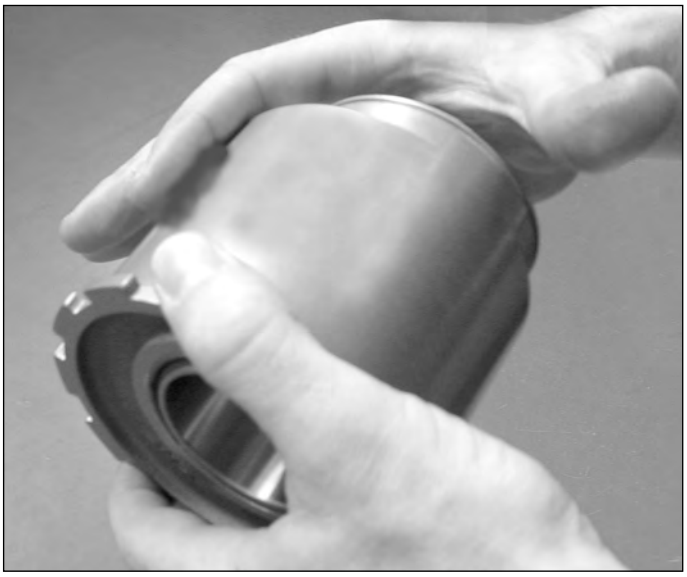
Do not apply grease to the threads of the pins.

Tighten the five nuts to the prescribed torque as shown in the figure.

Torque pressure: 45 ÷ 50 N.m.

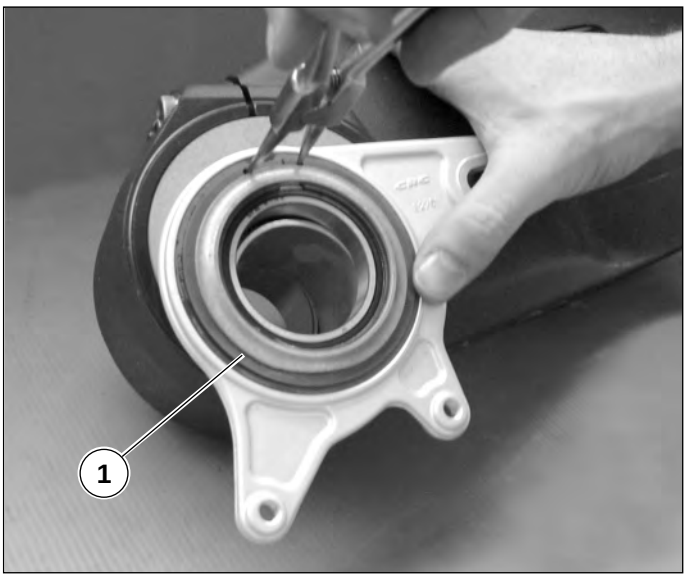
Reassembly wheel hub

Lightly grease the wheel hub.
Introduce the hub to the fork from the left side of the motorcycle and push it in.
Screw in the two screws without tightening.



Recommended grease: Agip Grease 30

Assemble the brake caliper-carrying flange.
Grease the O-rings and insert them into their respective seats on the flange.
Assemble the rear spacer ring, then the brake caliper-carrying flange, the second spacer ring and the Seeger retaining ring (1).
It is important to ensure that the Seeger retaining ring is inserted around the whole circumference of the seat.



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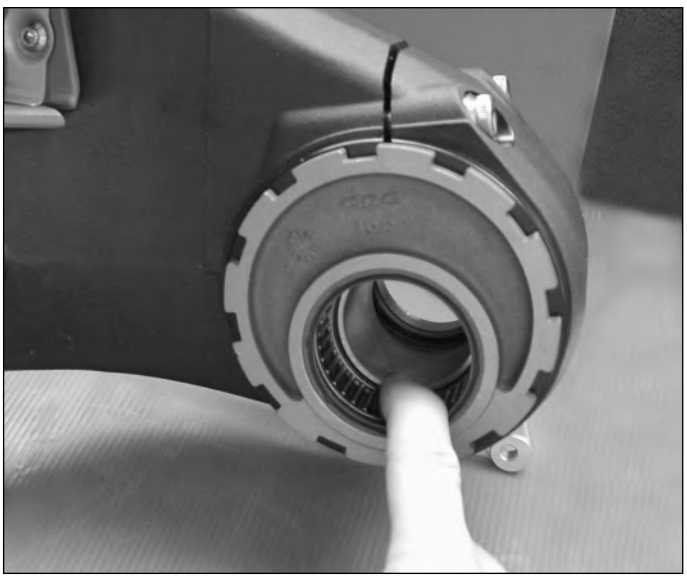
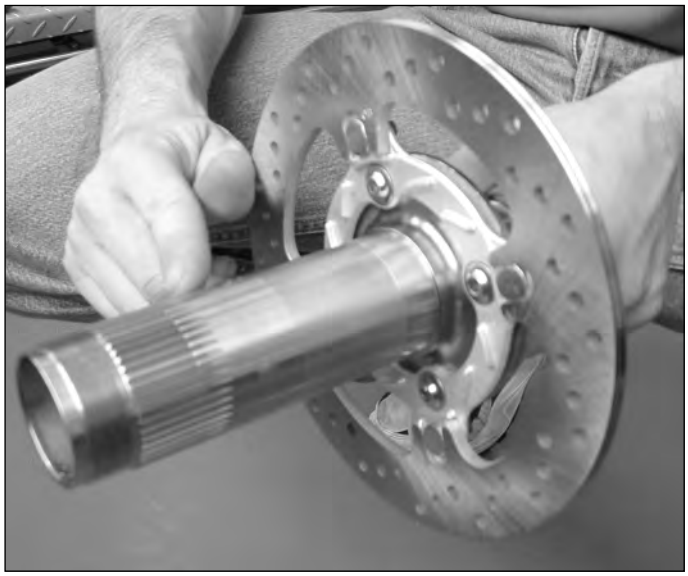
Introduce the first spacer.
Grease and insert the roller bearing unit.
Assemble the second spacer.



Recommended grease: Agip GR SM
(If the recommended grease cannot be found, it is possible to use a product having the following characteristics:
- Lithium grease and molybdenum disulphide
- NLGI consistency: 2
- Dropping point: ASTM: 190°C
- Base oil viscosity at 40°C: 160 cSt)

Reassembly rear wheel pin

Grease the wheel pin and introduce it carefully into the hub.



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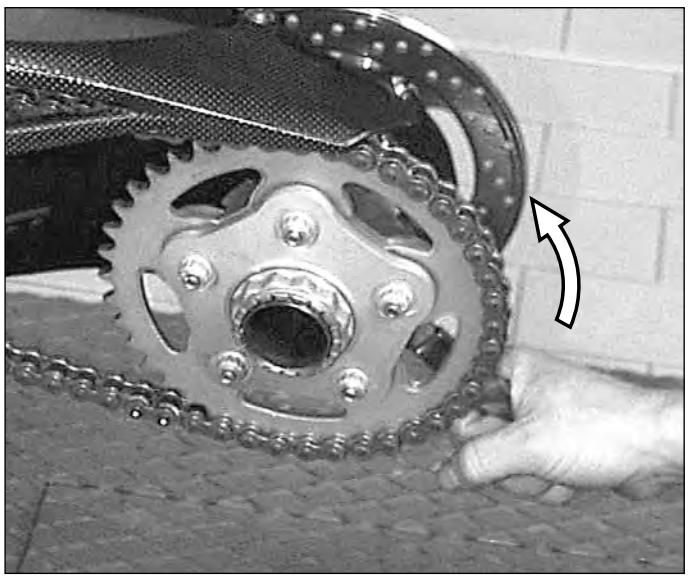
Insert the spacer ring illustrated in the figure onto the wheel pin.
Insert the crown wheel assembly, the second spacer ring and the wheel pin fixing nut.
Tighten the nut to the prescribed torque.

Torque pressure: 200 ÷ 220 N·m

Assemble the retaining ring.

Chain assembly

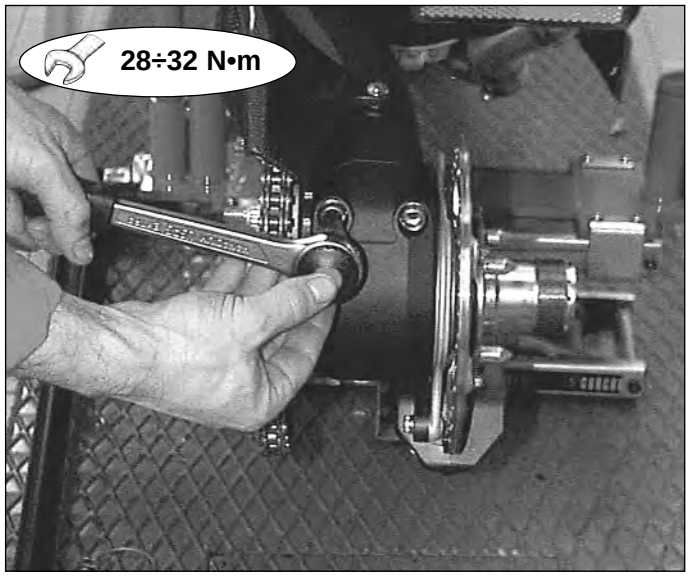
Utilising the special tool, screw the eccentric adjuster forward so that the chain can be inserted.
Mount the chain onto the crown wheel and adjust the eccentric adjuster until the chain is taught but not tight (see the information printed on the chain adjustment nameplate).



Tighten the hub screws to the prescribed torque pressure. Do not go past this limit.

WARNING
Exceeding the prescribed tightening torque may seriously damage the rear wheel hub and endanger the driver's safety.

Torque pressure: 28 ÷ 32 N·m



Wheel assembly

In the case of substitution of the rear tyre it will be necessary to effectuate the balancing of the wheel before assembling it. Follow the instructions indicated in page 62.

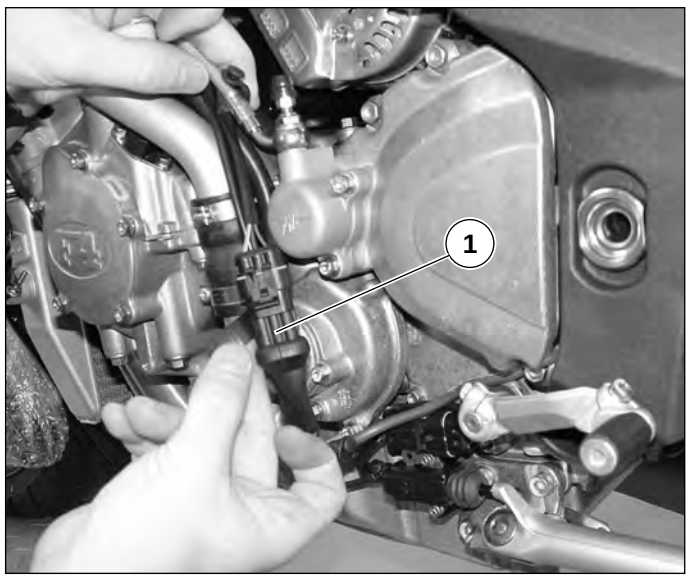
Insert 1st gear.
Reassemble the rear wheel.
Tighten the wheel axis nut to the prescribed torque pressure.

Torque pressure: 220 ÷ 240 N·m

Insert the retaining ring.

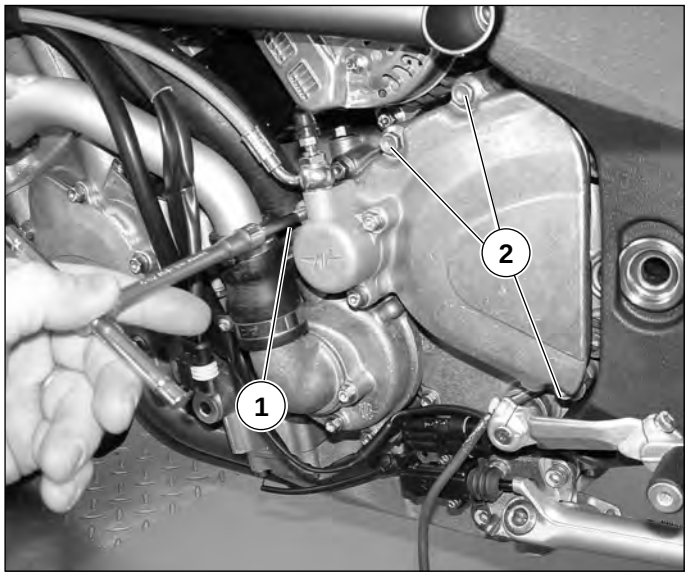
Pinion wheel removal

Remove the two rubber bands and disconnect the speed sensor connector (1).



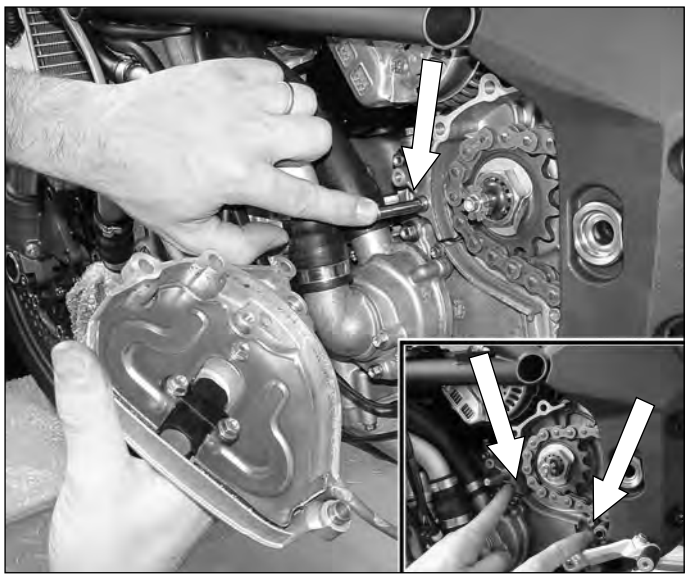
F

Remove the screw (1) of the clutch control cylinder and the three screws (2) of the pinion wheel cover.



F

Remove the cover being careful to not extract the clutch control rod (it must remain inserted in the engine) and be careful to not lose the two centralising bushes indicated in the figure.



Straighten the metal tongue with a flat-head drift and hammer.
Unscrew the pinion wheel retaining nut.

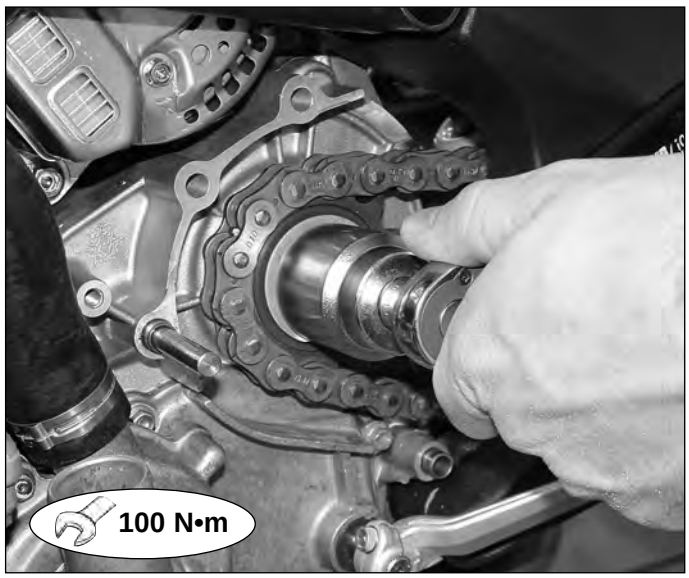
⚠ **Be careful to not hit the timing wheel situated on the extremity of the pinion shaft during this operation.**

Slacken the chain (see page 48), bring it forward and slide it off the pinion wheel.
Effectuate this operation only if the pinion wheel has to be substituted.
If the pinion wheel and crown wheel assembly have to be substituted, it is advisable to operate by cutting the chain (see page 42) to facilitate the operation.

For reassembly, insert the pinion wheel with the chain already attached.
Take a new washer, assemble it with the nut and tighten to the prescribed torque pressure utilising Loctite thread-locking fluid.
Hammer the new washer down onto the two opposite faces of the hexagon.

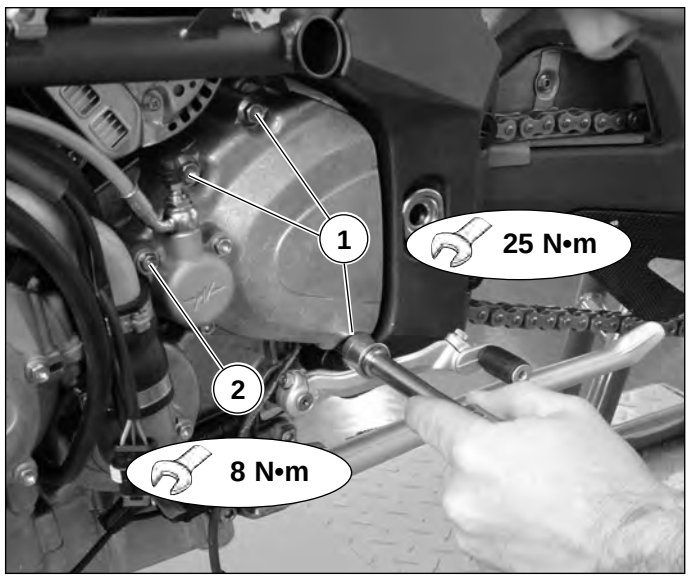
Torque pressure: 100 N·m

Recommended thread-locking fluid: Loctite 270



Reassemble the pinion wheel cover after having cleaned the support base.
Screw in the four screws lightly and proceed with the tightening, screwing down respectively on the three screws M8 (1) and on the screw M6 (2).
Replace the rubber bands and reinsert the electrical connector.

Torque pressure (M8 screws): **25 N·m**
Torque pressure (M6 screw): **8 N·m**

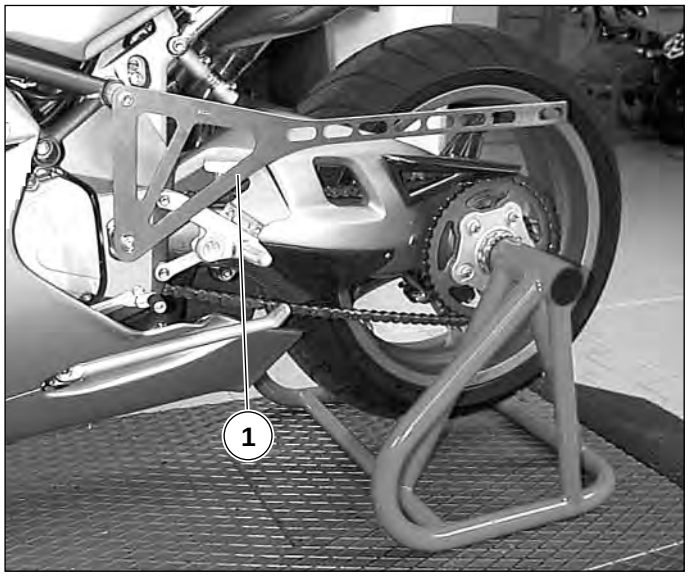


MOTORCYCLE SET-UP ADJUSTMENT

Place the motorcycle on the rear stand.

Special tool no. 800092642

Insert the setting-up arm (1) of the rear suspension (special tool) in its appropriate seats as shown in the figure.

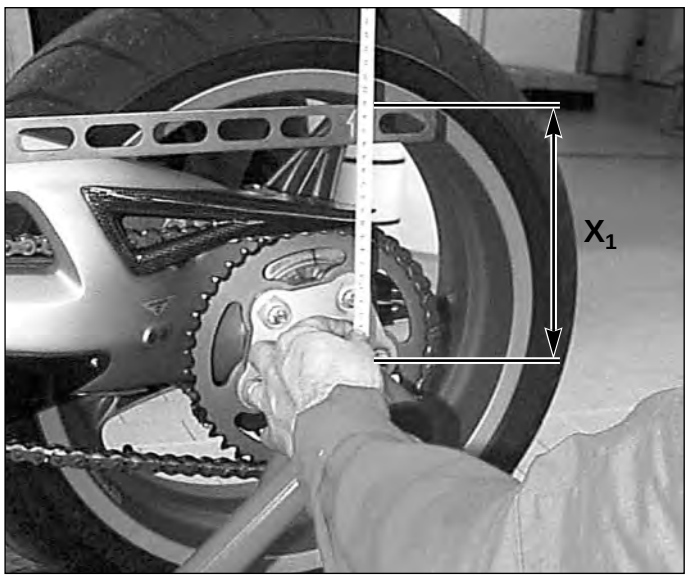


Special tool no. 800093347

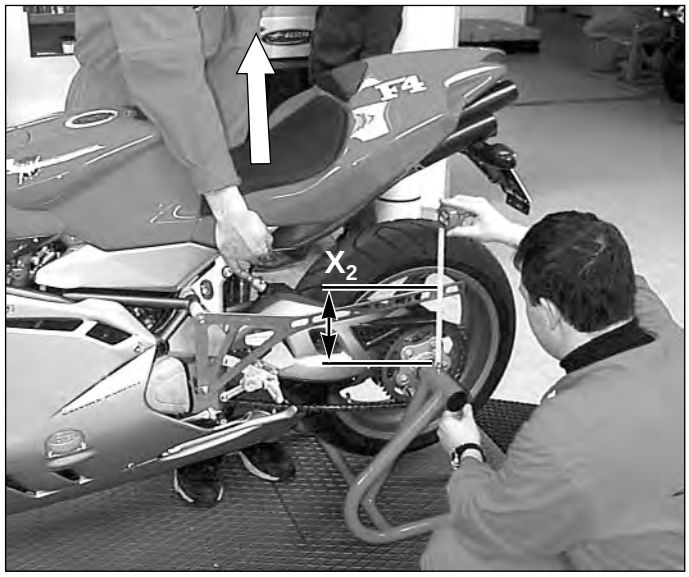
F

Press down on the seat so that the shock absorber is compressed and then let it go back into its resting position.

Measure the distance X_1 between the upper extremity of the rear stand tube and the point on the setting-up arm indicated by the arrow in the figure.



Raise the rear part of the motorcycle until the full extension of the rear shock absorber is reached. Contemporaneously measure the distance X_2 between the upper extremity of the rear stand and the point on the setting-up arm shown in the figure.



N.B. **Two persons must carry out this operation.**

Calculate the static slack Δ according to this formula:

$\Delta = X_2 - X_1$

The value of the static slack should be equal to:

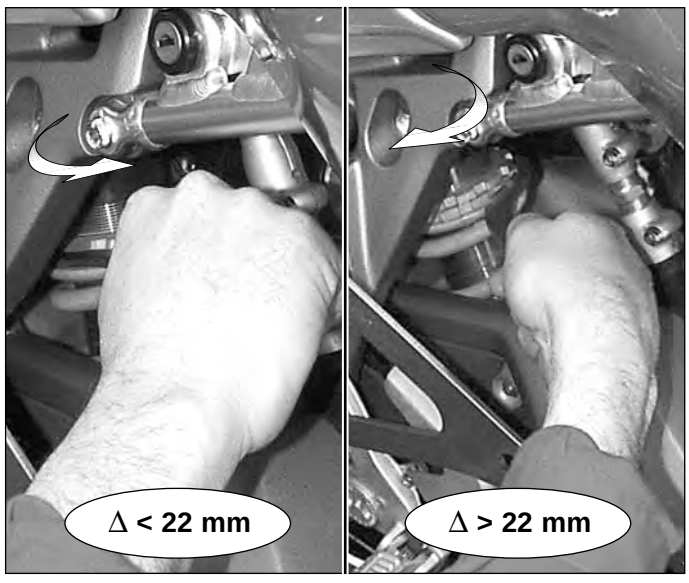
Δ = 22 mm

If the static slack value is different from the indicated value, it is necessary to effectuate the following adjustment to the shock absorber spring.

Slacken the upper lock ring of the rear shock absorber, rotating it in the direction indicated in the figure by utilising a 75 mm key spanner.

Rotate the lower lock ring as shown in the figure, either in a clockwise or anti-clockwise direction, according to the static slack Δ value calculated.

Δ < 22 mm: Rotate in an anti-clockwise direction
Δ > 22 mm: Rotate in a clock-wise direction

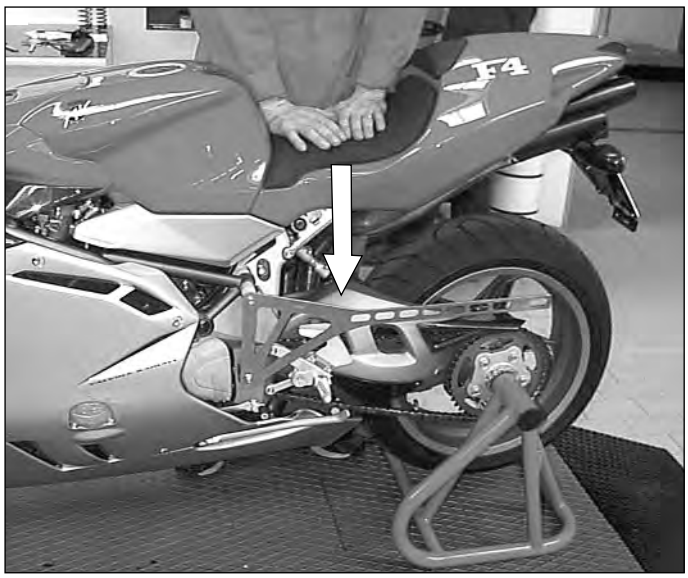


At the end of the spring adjustment operation, tighten the upper lock ring as shown in the figure. Re-measure the distance X_1 and X_2 and check that the static slack r coincides with the correct value. If not, repeat the spring adjustment operation until the correct measurement is reached.

F

After making the rear shock absorber adjustment, it is necessary to determine the value of the static set-up quota **X**.

Press down on the seat so that the rear shock absorber is compressed, after which allow the motorcycle to return to its rest position.

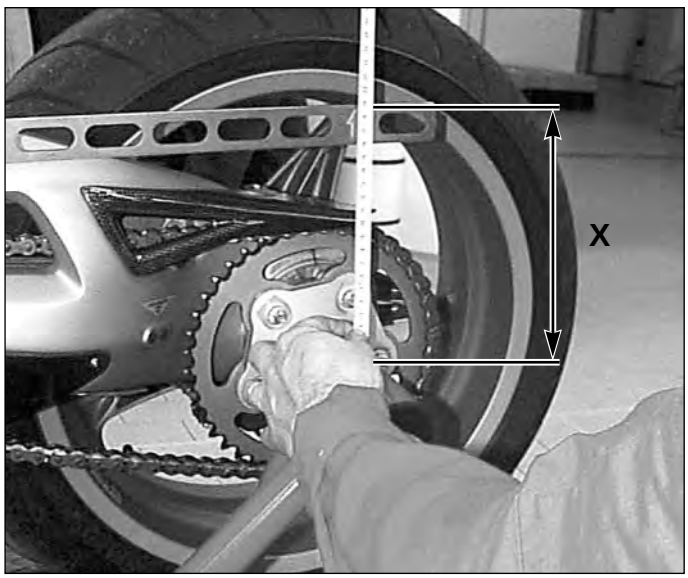


Measure the distance **X** between the upper extremity of the rear stand and the point of the set-up arm indicated in the figure.

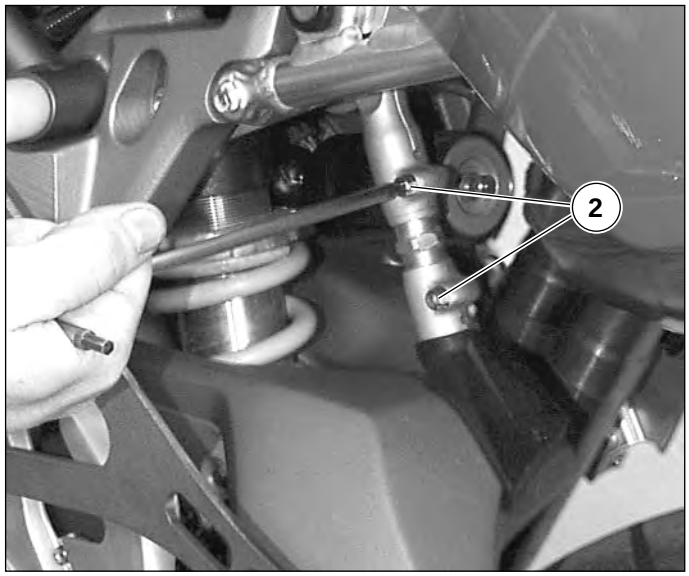
This distance represents the static set-up quota of the motorcycle. It should be equal to the following value:

X = 190 mm

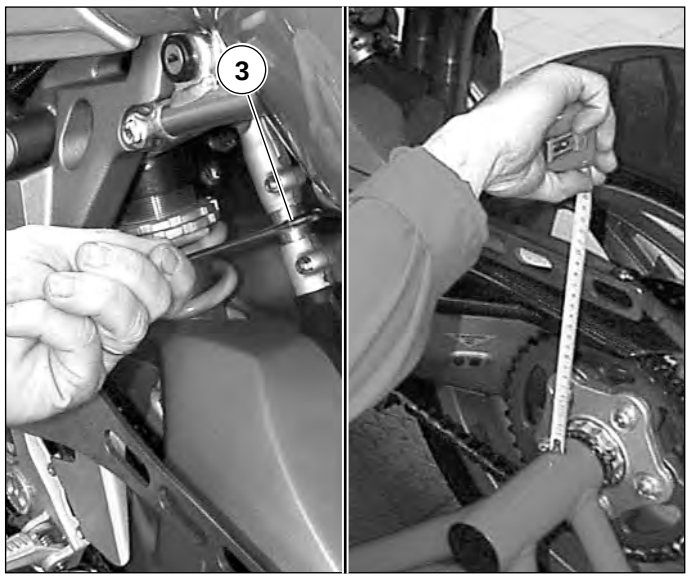
If the quota differs from the indicated value, it is necessary to carry out the following adjustment operation on the connecting rod of the rear suspension.



Slacken the fixing screws (2) of the semi-connecting rods of the rear suspension.



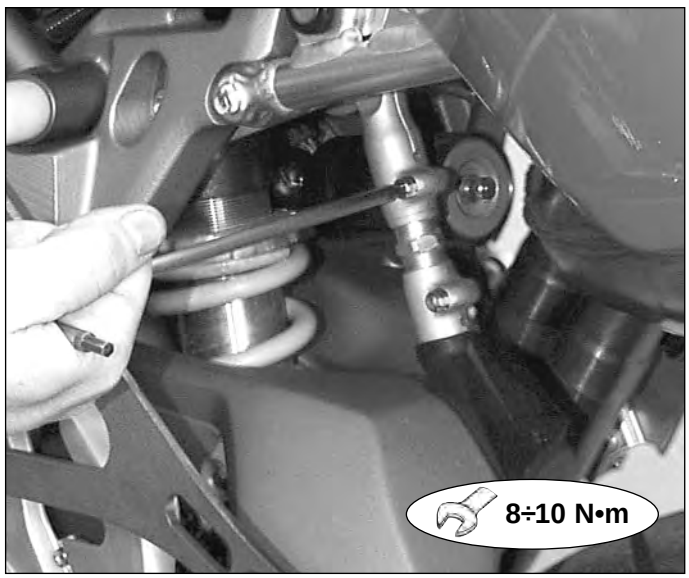
Utilising a hexagonal spanner, vary the inter-axis between the two semi-connecting rods by adjusting the adjustment screw (3). Contemporaneously, measure on the set-up rod the consequent variation of the static set-up **X**.
Continue the operation until the quota is equal to 190 mm.



Tighten the fixing screws of the semi-connecting rods to the prescribed torque pressure.

Torque pressure: 8÷10 N•m

After having completed the adjustment of the motorcycle set-up, it is necessary to adjust the tension of the chain.
Check also the orientation of the front headlight and if necessary effectuate the necessary adjustments. Both these operations are described in chapter B “Maintenance”.



WHEEL BALANCE CHECK

If the tyres are substituted, it is necessary to effectuate the following operations balancing and checking the wheels.

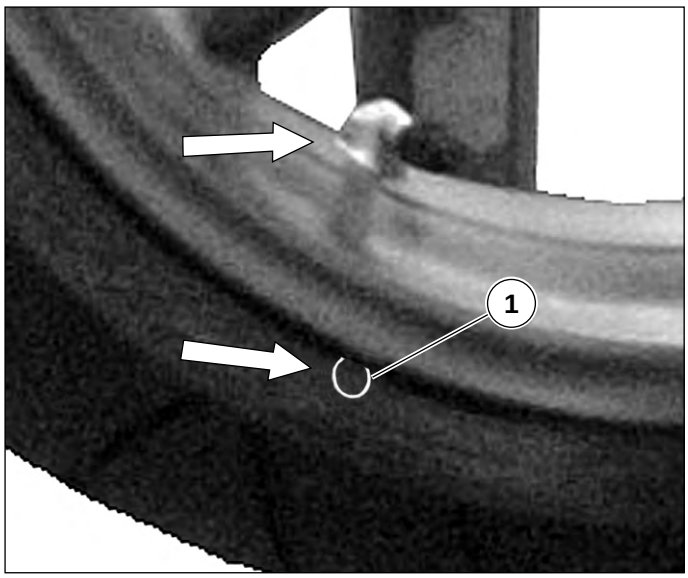
Front wheel balancing

Mount the wheel onto an adequate support similar to that shown in the figure, utilising a ground pin of 35 mm diameter. Check the wheel utilising a micrometer gauge and check the following tolerances:

Ovalization and maximum eccentricity must not exceed **0.5 mm**.
Flatness must not exceed **0.5 mm**.

F

When effectuating balancing on certain makes of tyres, it is necessary to refer to the yellow mark (1) present on the side of the tyre as shown in the figure. It indicates the lightest point of balancing and must be situated close to the tyre valve when the tyre is mounted onto the wheel rim.



Rear wheel balancing

Before mounting the rear wheel on the appropriate tool, insert the balancing tool into the central hole of the wheel.

Special tool no. 800092865

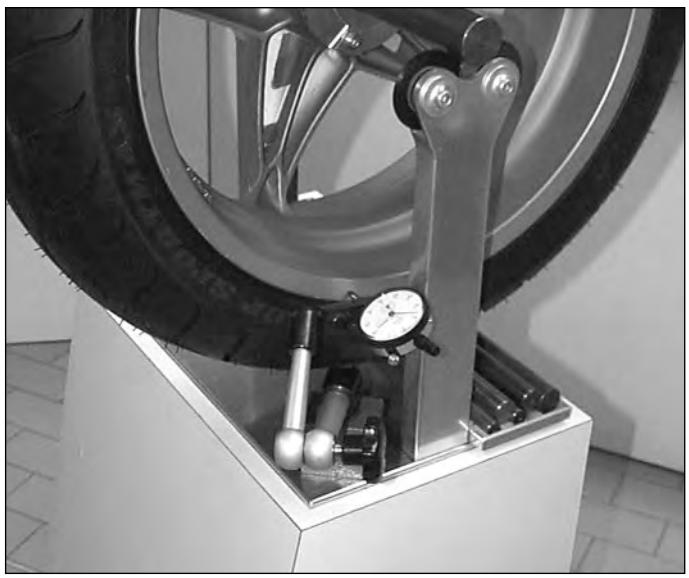
Insert the polygonal nut of the balancing tool from the opposite side and screw it onto the threaded part of the tool so that the tool can be fixed to the wheel.

Mount the wheel onto an adequate support similar to that shown in the figure, utilising a ground pin of 35 mm diameter. Check the wheel utilising a micrometer gauge and check the following tolerances:

Ovalization and maximum eccentricity must not exceed **0,5 mm**.

Place the micrometer gauge as shown in the figure and check the flatness.

Flatness must not exceed: **0,5 mm**.



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